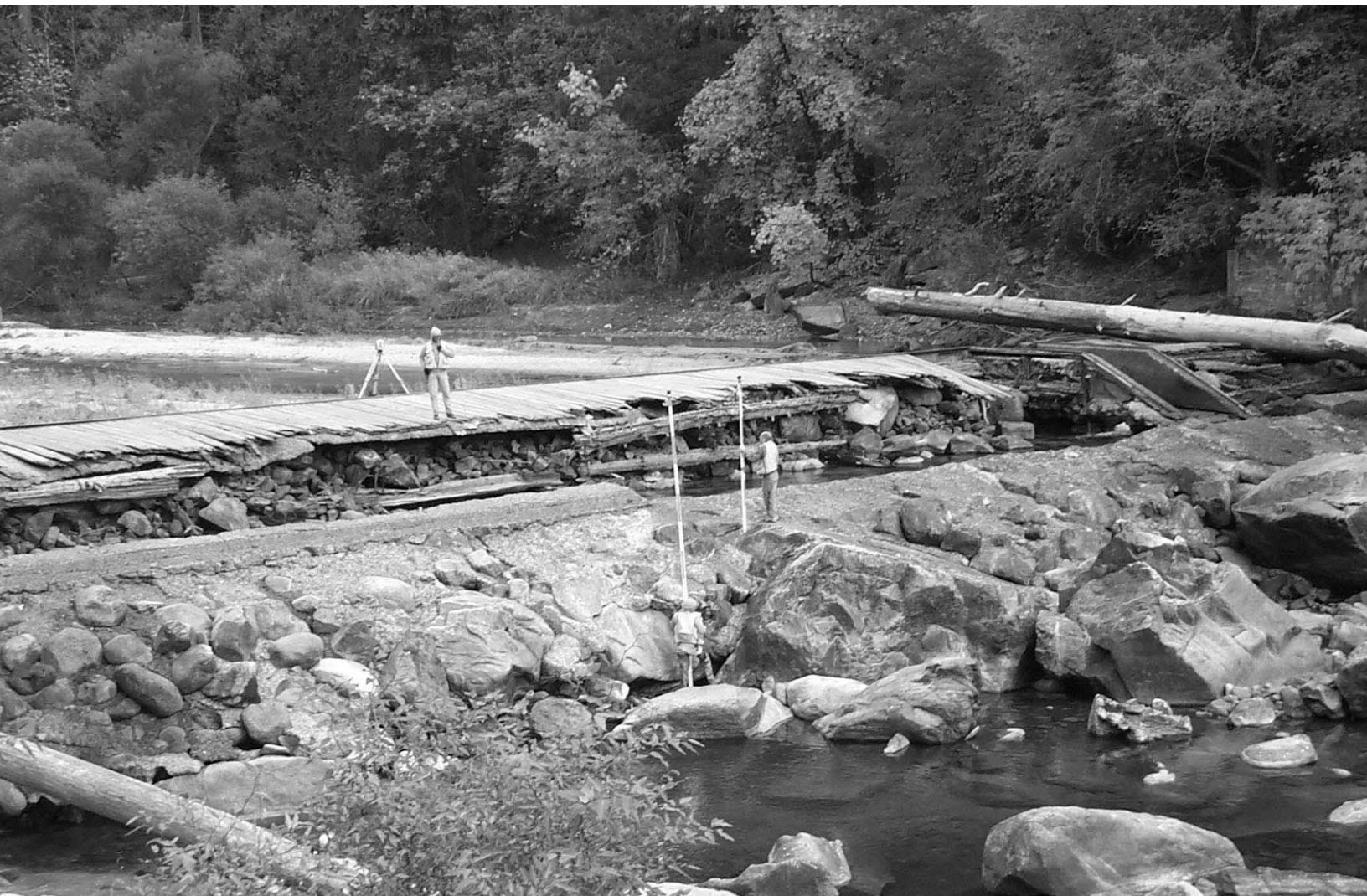




Cascades Diversion Dam Removal Project

Finding of No Significant Impact,
Merced Wild and Scenic Rivers
Section 7 Determination, and
Wetland Statement of Findings
May 2003



Yosemite National Park

National Park Service
U.S. Department of the Interior



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Cascades Diversion Dam Removal Project

Yosemite National Park

Lead Agency: National Park Service

Finding of No Significant Impact

Purpose and Need

This Finding of No Significant Impact documents the decision of the National Park Service (NPS) to adopt a plan to remove Cascades Diversion Dam and the determination that no significant impacts on the human environment are associated with that decision. The purpose of the Cascades Diversion Dam Removal Project is to remove an unnatural obstruction on the Merced River and to restore the river's natural free-flowing condition. This removal project is consistent with the Wild and Scenic River guidance provided in the *Merced Wild and Scenic River Comprehensive Management Plan* (Merced River Plan) and will meet the direction of the *Yosemite Valley Plan*, which calls for the dam removal of the dam.

Cascades Diversion Dam is classified as a high-hazard structure. It is in unsatisfactory condition due to flood damage sustained in 1997 and to continuing deterioration associated with age. In addition, the dam no longer serves a useful purpose – water is not diverted from the site to generate electricity or for other uses, and the impoundment does not regulate high water. Removal of the existing dam structure is necessary to prevent possible uncontrolled and sudden failure, which could result in a release of impounded water and the deposition of concrete and timber debris, grouted rockfill, and impounded sediment along the downstream channel. Such an occurrence could pose a considerable threat to valued resources (such as aquatic life, scenic vistas, and recreational opportunities), infrastructure (El Portal Road, wastewater, telephone, and electrical lines), and human life. In addition, the National Park Service is entrusted with conserving and restoring park values. This responsibility includes protecting the biological and physical processes that created the park, along with scenic features, natural landscapes, and native plants and wildlife. The removal of the dam would work toward fulfilling this mandate by restoring this segment of the Merced River. A complete description of the proposal and its environmental consequences are contained in the Cascades Diversion Dam Removal Project Environmental Assessment.

Alternatives Analyzed

The Cascades Diversion Dam Removal Project Environmental Assessment analyzed three alternatives, Alternative 1: No Action, Alternative 2: Complete Dam Removal, and Alternative 3: Partial Dam Removal. The National Park Service developed these alternatives based on the proposed action's purpose and need, issues raised during scoping, and other public comment. The Cascades Diversion Dam Removal Project Environmental Assessment disclosed the potential

environmental consequences that may result from implementation of each alternative. Comments received during public review of the Cascades Diversion Dam Removal Project Environmental Assessment were considered in preparation of this Finding of No Significant Impact and are summarized in the Cascades Diversion Dam Removal Project Summary of Public Comments and Responses (NPS 2003).

Alternative 1: No Action Alternative

The No Action Alternative maintains the status quo at Cascades Diversion Dam, as described in Chapter III, Affected Environment. It provides a baseline from which to compare the action alternatives, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes.

Under the No Action Alternative, Cascades Diversion Dam would continue to degrade and would eventually fail. Dam failure would likely occur during high-flow conditions, releasing large debris and sediments to the river and banks. In addition, continued deterioration of the dam over time would result in the release of large debris. Dam debris could damage downstream natural, cultural, and scenic resources as well as recreation opportunities and park facilities. Dam debris could also result in serious injury and/or fatality to recreational users of the river. There are voids under the existing timber crib sheathing and many boards are on the verge of collapse that create a potential safety hazard for people walking on the wooden crest of the dam. The National Park Service would remove dam debris from the river as soon as possible following release, although debris retrieval would not likely commence until low-flow conditions, which could be several months after dam failure or debris release. Diverted riverflows and erosion could result in adverse impacts to vegetation, soils, and cultural resources along the riverbanks. Over the long term, uncontrolled dam failure would restore free flow of the Merced River at this location.

Alternative 2: Complete Dam Removal

Alternative 2 includes complete removal of the dam, the dam abutments, the intake structure, and the screenhouse, and restoration of the related river channel located beneath the dam site. Approximately 4,400 to 5,400 cubic yards of sediments (including rock and boulders) in the area upstream of the dam would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Natural river processes would continue to transport remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover over time, as sediments are transported from the impoundment area. However, the rate of natural channel recovery and restoration would be monitored to determine if additional restoration actions were necessary. Following removal of the river-right abutment, intake structure, and screenhouse, the river-right bank would be stabilized using a bioengineered bank stabilization system (brush layering incorporated into a boulder structure) to prevent erosion. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent riverbank segments.

Alternative 3: Partial Dam Removal

Alternative 3 includes complete removal of the dam, the river-left dam abutment, and the screenhouse on the river-right intake structure, and restoration of the related river channel located beneath the dam site. Under this alternative the river-right dam abutment and intake structure would be retained for use as a river viewing platform. Approximately 4,400 to 5,400 cubic yards of sediments (including rocks and boulders) in the area upstream of the dam would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Natural river processes would continue to transport remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover incrementally over time, as sediments are transported from the impoundment area. However, the rate of natural channel recovery and restoration would be monitored to determine if additional restoration actions were necessary. Following removal of the dam and screenhouse, the river-right bank would be stabilized upstream and downstream of the intake structure using a bioengineered bank stabilization system to prevent erosion of the river-right bank. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent riverbank segments.

Alternatives Considered but Dismissed

The National Park Service considered five additional alternatives to the proposed action that were dismissed from further consideration because they did not meet the project's purpose and need. These included:

- **Remove Cascades Diversion Dam and Complete Sediment Removal.** Removal of the Cascades Diversion Dam in conjunction with complete removal of the 15,000 to 20,000 cubic yards of sediment in the upstream impoundment would remove sediments that were present prior to construction of the dam in 1917. Removal of sediment present prior to dam construction would not result in the re-establishment of a near-natural river channel and related riparian habitat. In addition, this alternative would require 700 to 750 truck trips to remove dam materials and sediment and would entail a project duration of seven months. This would result in greater impacts to air quality, traffic and access, and recreation-related experience than the action alternatives considered in this environmental assessment.
- **Restore Cascades Diversion Dam and Hydroelectric Generating Facility.** Repair of Cascades Diversion Dam and the entire hydroelectric generating facility to fully functioning capacity would require complete removal and reconstruction of the dam overflow structure, reconstruction of approximately one mile of penstock, which would need to be installed under El Portal Road (Highway 140), reconstruction of the tailrace (or outlet channel), and purchase and installation of new generating equipment in the powerhouse. Although this alternative would alleviate the high-hazard condition of the dam, consistent with the project's Need, it is inconsistent with the Purpose of the project to remove an unnatural obstruction on the Merced River and to restore the river's free-flowing condition, consistent with the Merced River Plan (NPS 2001a) and Yosemite Valley Plan (NPS 2000a).
- **Replace Cascades Diversion Dam with Boulders.** This option would require complete removal of the dam overflow structure and installation of large boulders at the current dam site to impound water and limit downstream sediment transport. This option would perpetuate unnatural conditions at the site, limiting free flow of the Merced River and other natural

processes. Similar to the above scenario, this option is inconsistent with the Purpose of the project.

- **Remove Portions of the Dam Over Time.** This option would remove the dam overflow structure, abutments, and the intake structure in phases over a series of years, ultimately resulting in complete removal of all structures and impounded sediments. Phased removal of the dam over a period of years would expand removal-related impacts. For example, transportation- and recreation-related effects of removal would last years instead of one season. Removing only a portion of the dam's overflow structure in the first season could destabilize remaining structures and could result in uncontrolled failure. Uncontrolled failure of the remaining structures would have downstream impacts on resources and free flow of the Merced River and has potential to adversely affect park facilities, recreational uses, and visitors, similar to the No Action Alternative. Therefore, this alternative would not be consistent with the Need for this project.
- **Combine the Removal of Cascades Diversion Dam with the Final Phase of the El Portal Road Improvement Project.** The National Park Service intends to remove Cascades Diversion Dam, let natural processes prevail through this reach of the Merced River, and allow the river to stabilize. If the National Park Service decides to proceed with the El Portal Road Improvement Project – Cascades Dam to Pohono Bridge, potential future designs will need to comply with the Wild and Scenic Rivers Act as well as other legislation and park planning documents. Although the Cascades Diversion Dam Removal Project is completely distinct from the El Portal Road Improvement Project, the road improvement project is included in the cumulative impact analysis in the Cascades Diversion Dam Removal Project Environmental Assessment because it is a reasonably foreseeable project that the National Park Service may decide to pursue.

Environmentally Preferable Alternative

The environmentally preferred alternative is determined by applying criteria identified in Section 101 of the National Environmental Policy Act to each alternative considered. In accordance with the National Environmental Policy Act, the environmentally preferred alternative would best: (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice; (5) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approaching the maximum attainable recycling of depletable resources.

The National Park Service has considered all alternatives in this analysis in accordance with National Environmental Policy Act and Council on Environmental Quality regulations (Council on Environmental Quality Regulations, Section 1505.2) and has determined that Alternative 2: Complete Dam Removal, as presented in the Cascades Diversion Dam Removal Project Environmental Assessment is environmentally preferable. After review of potential resource and visitor impacts, and developing mitigation for impacts to natural and cultural resources, the preferred alternative achieves the greatest balance between (1) providing a high level of protection of natural and downstream cultural resources while concurrently attaining the widest

range of beneficial uses of the environment without degradation; (2) reducing risks to public health and safety; and (3) providing aesthetically pleasing surroundings.

Why the Preferred Alternative Will Not Have a Significant Effect on the Human Environment

Complete dam removal under Alternative 2 would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing its biologic and hydrologic integrity. Overall, there would be long-term minor to moderate beneficial impacts on soils, public safety with respect to geologic hazards, hydrologic processes, water quality, vegetation, fish and wildlife habitat, scenic resources, orientation and interpretation, and park operations. There would be negligible to minor beneficial impacts related to air quality, noise, transportation, recreation, and socio-economics. There would be adverse short-term removal-related impacts to the above resources, which would be reduced by the application of Best Management Practices and resource-specific mitigation measures (see Mitigation, below).

There would be no net loss of wetland habitat as a result of the project. As the base level of the river drops following dam removal, and the river stabilizes, the channel of the Merced River would narrow in the vicinity of the dam. As the river narrows, there would be a change in wetland habitat from riverine upper perennial wetland (currently located in the main channel of the Merced River) to palustrine forest, scrub shrub, or emergent wetlands that would line the narrower river channel. There could be a temporary reduction in the size of wetlands that line the Merced River channel, as wetland vegetation establishes in proximity to the new river channel.

Dam removal activities would have a short-term impact to special-status species associated with ground disturbance and the potential introduction of pollutants. However, dam removal activities would occur in a controlled manner, with the application of mitigation, reducing the adverse effect to a negligible intensity. Removal of Cascades Diversion Dam and revegetation would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing the biological integrity of this segment for Wawona rifle beetle and harlequin duck. The bioengineered bank stabilization and revegetation would have a beneficial effect on habitat for special-status bats and California spotted owl at this location.

Ground-disturbing activities under the preferred alternative could have a local, long-term, minor, adverse impact to as-yet unknown archeological resources. Any actions would be performed in accordance with stipulations in the park's 1999 Programmatic Agreement. Ground-disturbing activities under the preferred alternative could also affect ethnographic resources. Any actions would be performed in accordance with stipulations in the park's 1999 Programmatic Agreement, such as disturbance avoidance or culturally sensitive design measures. In addition, the park would continue to consult with culturally associated American Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. Therefore, the preferred alternative would result in a local, short-term, negligible, adverse impact to ethnographic resources. These impacts are not considered significant because of their short duration and low intensity. In addition, mitigations are incorporated into the project design.

The impact of the removal of Cascades Diversion Dam was evaluated and disclosed in the *Yosemite Valley Plan Supplemental Environmental Impact Statement* (Yosemite Valley Plan) (NPS 2000). This environmental assessment is tiered to the Yosemite Valley Plan and provides greater

detail on the manner in which the dam would be removed. Controlled removal of Cascades Diversion Dam under the preferred alternative would be conducted in compliance with the park's 1999 Programmatic Agreement. This would avoid impacts to downstream cultural properties. As to the removal of the dam itself, the Yosemite Valley Plan disclosed that the impact of removing this cultural property is moderate and adverse. The park has already satisfied the mitigation requirements specified for this point in the process in the 1986 Memorandum of Agreement between the park and the State Historic Preservation Officer. The Memorandum of Agreement requires additional mitigation measures once the dam is removed.

The Cascades Dam Removal Project Environmental Assessment also analyzed cumulative impacts of the project, and in no case were cumulative impacts considered significant. Complete removal of Cascades Diversion Dam would have both long-term and short-term impacts on natural, cultural, and social resources, though none of the impacts are considered a significant effect on the human environment as defined in the National Environmental Policy Act. In addition, no highly uncertain or controversial impacts, unique or unknown risks, or elements of precedence have been identified, and implementing the preferred alternative will not violate any federal, state, or local environmental laws.

Non-impairment of Park Resources

Pursuant to the 1916 Organic Act, the National Park Service has a management responsibility “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of future generations.” Therefore, the National Park Service cannot take an action that would “impair” park resources or values.

Based on the analysis provided in the Cascades Diversion Dam Removal Project Environmental Assessment, the National Park Service concludes that implementation of Alternative 2, Complete Dam Removal, would have no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Yosemite National Park; (2) key to the natural or cultural integrity of Yosemite National Park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's General Management Plan or other relevant National Park Service planning documents. Consequently, implementation of the proposed action will not violate the National Park Service Organic Act.

Mitigation

The following mitigation measures (table 1-1) have been incorporated into the project to avoid or reduce impacts to park resources.

**Table 1-1
Mitigation Matrix**

Mitigation Measure	Responsibility	Critical Milestone
<i>SUSTAINABLE DESIGN AESTHETICS</i>		
The project shall avoid or minimize impacts to natural, cultural, and social resources. The project shall be designed to work in harmony with the surroundings, particularly the Merced River transition between Yosemite Valley and the downstream gorge. The project shall reduce, minimize, or eliminate air and water nonpoint-source pollution. The project shall be sustainable whenever practicable, by recycling or reusing materials, by minimizing materials, and by minimizing energy consumption during the project.	Yosemite National Park Contractor	Prior to and concurrent with project activities
<i>GENERAL BEST MANAGEMENT PRACTICES DURING PROJECT ACTIVITIES</i>		
Inspect the project to ensure that the extent of impacts stay within the parameters of the project and do not escalate beyond the scope of the environmental assessment, as well as to ensure that the project conforms with the U.S. Army Corps of Engineers Special Site Permit, Cascades Dam Removal (as amended) and Merced River Cascades Restoration Report and the Central Valley Regional Water Quality Control Board Waiver of Waste Discharge Requirements and Water Quality Certification, Cascades Dam Removal, and other applicable permits or project conditions.	National Park Service Project Manager	Concurrent with project activities
Implement compliance monitoring to ensure the project remains within the parameters of National Environmental Policy Act and National Historic Preservation Act compliance documents, U.S. Army Corps of Engineers Section 404 permits, etc. Compliance monitoring would ensure adherence to mitigation measures and would include reporting protocols.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Implement natural resource protection measures. Standard measures include demolition scheduling, biological monitoring, erosion and sediment control, use of fencing or other means to protect sensitive resources adjacent to the work area, and revegetation. The measures include specific monitoring by resource specialists as well as treatment and reporting procedures.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Implement the requirements of the 1999 Programmatic Agreement between the National Park Service, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the "Resolution of Adverse Effects" associated with planning construction, operations, and maintenance activities within Yosemite National Park (i.e., review of project design, avoidance of sensitive cultural resource areas, monitoring of project activities as appropriate, ongoing tribal consultation).	National Park Service Project Manager Yosemite National Park Contractor	Prior to, concurrent with, and upon completion of project activities
Implement the requirements of the 1999 Agreement between the National Park Service and the American Indian Council of Mariposa County, Inc. for conducting traditional activities. In addition, consult with the American Indian Council of Mariposa County regarding appropriate plant species to be included in site restorations.	Yosemite National Park	Prior to and concurrent with project activities
Confine work areas within the river channel, such as workpads to support demolition equipment, to the smallest area necessary.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Limit the amount of rock and sediment required for the river-right bank bioengineered bank stabilization to the minimum required to stabilize and protect the slope from erosion. Amount shall be determined in consultation with National Park Service Resources Management staff during final project design.	National Park Service Project Manager Contractor	Concurrent with project activities
Clean heavy equipment prior to its entry into the park to prevent importation of non-native plant species, and repair all petroleum leaks prior to work near the Merced River. Tighten hydraulic hoses and ensure they are in good condition.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities

Table 1-1 (Continued)
Mitigation Matrix

Mitigation Measure	Responsibility	Critical Milestone
<i>GENERAL BEST MANAGEMENT PRACTICES DURING PROJECT ACTIVITIES (continued)</i>		
To minimize the possibility of hazardous materials seeping into soil or water, check equipment frequently to identify and repair any leaks, as directed in the Spill Prevention and Countermeasure Plan. Standard measures include hazardous materials storage and handling procedures; spill containment, cleanup, and reporting procedures; and limitation of refueling and other hazardous activities to upland/nonsensitive sites. Provide an adequate hydrocarbon spill containment system (e.g., floatable absorption boom, absorption materials, etc.) on site, in case of unexpected spills in the project area. Ensure equipment allowed within the river channel is equipped with a hazardous spill containment kit. Ensure that personnel trained in the use of hazardous spill containment kits are on site at all times during dam removal activities.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Store all construction equipment within the delineated work limits.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Implement measures to reduce effects of dam removal on visitor safety and experience. Safeguard visitors, contractors, and park personnel from removal activities. Implement a barrier plan indicating locations and types of barricades to protect public health and safety.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Provide information about the location, recreational closures, timing, and duration of work activity to visitors as they enter the park. Flag and/or fence off work areas to maintain visitor safety during both work and nonwork hours.	National Park Service Project Manager	Prior to and concurrent with project activities
Implement an interpretation and education program. Continue directional signs and education programs to promote understanding among park visitors.	Yosemite National Park	Prior to project activities
Implement a traffic control plan, as warranted. Include strategies to maintain safe and efficient traffic flow during the project work period.	Yosemite National Park	Prior to and concurrent with project activities
Ensure an emergency notification program is in place. Standard measures include notification of utilities and emergency response units prior to demolition activities. Identify locations of existing utilities prior to removal activity to prevent damage to utilities, particularly the wastewater lines that pass under El Portal Road within the project area. The Underground Services Alert and National Park Service maintenance staff shall be informed 72 hours prior to any ground disturbance. Demolition shall not proceed until the process of locating existing utilities is completed (wastewater, electric, and telephone lines). An emergency response plan shall be required of the contractor for measures that will be taken during all high-water events during dam removal, such as evacuation of personnel, equipment, and materials from the river, etc.	National Park Service Project Manager	Prior to project activities
Avoid damage to natural surroundings in and around the work limits. Provide temporary barriers to protect existing trees, plants, and root zones, if necessary, as determined by Resources Management vegetation management staff. Trees and other vegetation shall not be removed, injured, or destroyed without prior written approval. Ropes, cables, or fencing shall not be fastened to trees. All existing resource protection fencing (post and rope) shall be left in place and protected from heavy equipment.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Repair any asphalt surfaces that are damaged due to work on the project to original condition. Remove all debris from the project site, including all visible concrete, timber, and metal pieces. Grade disturbed areas and rake them smooth to eliminate tire tracks and tripping hazards.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities

Table 1-1 (Continued)
Mitigation Matrix

Mitigation Measure	Responsibility	Critical Milestone
<i>GENERAL BEST MANAGEMENT PRACTICES DURING PROJECT ACTIVITIES (continued)</i>		
Locate, contain, and stabilize excavated and stored materials within the upland staging areas and prevent reentry into the river.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Implement standard noise abatement measures during work. Standard noise abatement measures include the following elements: a schedule that minimizes impacts to adjacent noise-sensitive uses, use of the best available noise control techniques wherever feasible, use of hydraulically or electrically powered impact tools when feasible, and location of stationary noise sources as far from sensitive uses as possible (see Chapter III, Affected Environment, Noise). Ensure all construction equipment is equipped with mufflers kept in proper operating conditions, and, when possible, shut off equipment rather than allowing it to idle.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
If deemed necessary, demolition work on weekends or federal government holidays may be authorized, with prior written approval of the Superintendent. To the extent possible, perform all on-site noisy work above 76 dBA (such as the operation of heavy equipment) between the hours of 8:00 a.m. and 5:00 p.m. to minimize disruption to nearby park users.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Use silt fences, sedimentation basins, etc. in work areas to reduce erosion, surface scouring, and discharge to water bodies as defined in the Erosion Control Plan prepared for this project.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Delineate wetlands and apply protection measures during construction. Wetlands shall be delineated by qualified National Park Service staff or certified wetland specialists and clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
<i>RESOURCE-SPECIFIC DESIGN MEASURES</i>		
<i>HYDROLOGY, WATER QUALITY, AND FLOODPLAINS</i>		
<p>Prepare an erosion control plan specifying measures to prevent erosion/sedimentation problems during project construction. Include a map of the project site delineating where erosion control measures will be applied. Include the following minimum criteria, as listed in the Guidelines for Protection of Water Quality During Construction and Operation of Small Hydro Projects (CVRWQCB 1983):</p> <ul style="list-style-type: none"> ▪ Construction equipment shall not be operated in flowing water, except as may be necessary to construct crossings or barriers. ▪ Where working areas are adjacent to or encroach on live streams, barriers shall be constructed that are adequate to prevent the discharge of turbid water in excess of specified limits. ▪ Material from construction work shall not be deposited where it could be eroded and carried to the stream by surface runoff or high stream flows. ▪ All permanent roads shall be surfaced with materials sufficient to maintain a stable road surface. ▪ All disturbed soil and fill slopes shall be stabilized in an appropriate manner. ▪ Surface drainage facilities shall be designed to transport runoff in a nonerosive manner. ▪ Riparian vegetation shall be removed only when absolutely necessary. 	National Park Service Project Manager	Prior to and concurrent with project activities

Table 1-1 (Continued)
Mitigation Matrix

Mitigation Measure	Responsibility	Critical Milestone
HYDROLOGY, WATER QUALITY, AND FLOODPLAINS (continued)		
<ul style="list-style-type: none"> There shall be no discharge of petroleum products, cement washings, or other construction materials. Erosion control measures shall be in place prior to dam removal and maintained in good repair. Design stream diversion structures to preclude accumulation of sediment. If this is not feasible, an operation plan shall be developed to prevent adverse downstream effects from sediment discharges. 		
Erosion control measures shall be inspected daily during dam removal and monthly following removal, and repaired as required.	National Park Service Project Manager	Concurrent with project activities
<p>Waters shall be free of changes in turbidity that cause a nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits, as described in The Water Quality Control Plan for the Central Valley Regional Water Quality Control Board (CVRWQCB 1998). In determining compliance with the limits below, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected:</p> <ul style="list-style-type: none"> Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU. Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%. Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs. Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%. 	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Implement stormwater management measures to reduce nonpoint-source pollution discharge. This could include measures such as oil/sediment containment or street sweeping.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Remove hazardous waste materials generated during implementation of the project from the project site immediately.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Dispose of volatile wastes and oils in approved containers for removal from the project site to avoid contamination of soils, drainages, and watercourses. Keep absorbent pads, booms, and other materials onsite during projects that use heavy equipment to contain oil, hydraulic fluid, solvents, and hazardous materials spills.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
VEGETATION		
Implement a noxious weed abatement program. Standard measures include, as appropriate, the following elements: ensure that vehicles and equipment arrive onsite free of mud or seed-bearing material, certify all seeds and straw material as weed-free, identify areas of noxious weeds before dam removal, treat noxious weeds or noxious weed topsoil prior to work (e.g., topsoil segregation and removal), and revegetate with appropriate native species.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Cover exposed soil with a combination of locally acquired native duff and forest litter from adjacent riparian sites, providing immediate groundcover and facilitating natural revegetation.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities

Table 1-1 (Continued)
Mitigation Matrix

Mitigation Measure	Responsibility	Critical Milestone
VEGETATION (continued)		
Implement the planting prescriptions prepared for this project.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Develop and implement a monitoring plan to ensure successful revegetation, maintain plantings, and replace unsuccessful plantings.	National Park Service Project Manager	Prior to and concurrent with project activities
Use native or seed-free mulch to minimize surface erosion and introduction of non-native plants.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Confine all construction operations to specified project work limits. Install temporary barriers to protect natural surroundings (including trees, plants, and root zones) from damage. Avoid fastening ropes, cables, or fences to trees.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
As much as possible, removed plants and materials (cuttings) shall be salvaged and stored onsite for revegetation following dam removal.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
WILDLIFE		
Implement measures to reduce bear/human encounters. Measures include worker education on bear behavior; enforcement of park regulations; and removal of regular trash, all food-related items, and rubbish to bear-proof containers.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
Minimize night lighting during work. Where night lighting is necessary, design lighting to be minimal, directed downward, and shielded.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Educate workers on the dangers of intentional or unintentional feeding of park wildlife, and on inadvertent harassment through observation or pursuit.	National Park Service Project Manager Yosemite National Park Contractor	Prior to project activities
Bird Species		
To avoid conflicts with nesting birds, conduct activities outside the breeding season (typically from March to August).	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Remove trees or structures with unoccupied nests (stick nests or cavities) prior to March 1, or following the nesting season. Alternatively, if activities take place during the breeding season, a qualified biologist shall conduct a pre-work survey for individuals no more than two weeks prior to construction in March through August. If any special-status species is observed nesting, a determination shall be made as to whether or not the proposed action will impact the active nest or disrupt reproductive behavior. If it is determined that the action will not impact an active nest or disrupt breeding behavior, work shall proceed without any restriction or mitigation measure. If it is determined that dam removal activities will impact an active nest or disrupt reproductive behavior, then avoidance strategies shall be implemented. Dam removal activities could be delayed within 500 feet of such a nest until a qualified biologist determines that the subject birds are not nesting or until any juvenile birds are no longer using the nest as their primary day and night roost.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities

Table 1-1 (Continued)
Mitigation Matrix

Mitigation Measure	Responsibility	Critical Milestone
WILDLIFE (continued)		
<i>Mammal Species</i>		
Ensure excavation sites (trenches or pits) have suitable ramps to allow small mammals to exit these areas.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
A qualified biologist shall be available to inspect all excavations before refilling occurs, ensuring that special-status species are passively relocated to avoid incidental take.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Erect enclosure fencing prior to activities to ensure that no special-status species are within the work area.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
SPECIAL-STATUS SPECIES		
<i>Special-Status Aquatic Species</i>		
Work activities within potential special-status aquatic species habitat shall be completed during low-flow conditions.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
All work adjacent to or within aquatic habitats shall be regularly monitored.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
All fueling and maintenance of vehicles and equipment shall occur at least 65 feet from any aquatic habitat.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
The total area of activity shall be limited to the minimum necessary to achieve the project goal as determined collaboratively with contractors and National Park Service staff (including Resources Management staff).	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
During dewatering, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent aquatic species from entering the system. Release or pump water downstream at an appropriate rate to maintain downstream flows during work. Upon completion of activities, remove barriers to flow in a manner that allows flow to resume with the least disturbance to the substrate.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
Fence the downstream work boundary to limit the movement of aquatic species into the work area to the actively flowing water area of the channel and to control creek siltation and disturbance to downstream riparian habitat. An enclosure fence shall be installed in the creek channel both upstream and downstream of activities, as appropriate. Install fences at least four weeks prior to the commencement of any activities. Immediately after installation of the enclosure fence, a qualified biologist shall inspect all areas within the fence for aquatic species.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities

Table 1-1 (Continued)
Mitigation Matrix

Mitigation Measure	Responsibility	Critical Milestone
SPECIAL-STATUS SPECIES (continued)		
<i>Special-Status Species of Bats</i>		
A qualified biologist shall conduct surveys in the spring and immediately prior to dam removal to determine whether trees or other habitat (e.g., crevices) that would be affected by the proposed action provide hibernacula or nursery colony roosting habitat.	National Park Service Project Manager Yosemite National Park Contractor	Prior to and concurrent with project activities
If special-status species of bats are found breeding within the vicinity of the proposed action, no blasting shall occur between May 1 and September 1.	National Park Service Project Manager Yosemite National Park Contractor	Prior to project activities
If spring surveys reveal that the site is being used as a nursery colony, the action shall not occur until after August 15, when the pups are weaned and are volant.	National Park Service Project Manager Yosemite National Park Contractor	Prior to project activities
If surveys conducted immediately prior to dam removal do not reveal any bat species present within the project area, then the action shall begin within three days to prevent the destruction of any bats that could move into the area after the survey.	National Park Service Project Manager	3 days prior to project activities
Snags shall not be removed without prior approval from National Park Service wildlife biologist and/or plant ecologist. Riparian vegetation shall be retained to the extent possible to preserve important foraging habitat.	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
AIR QUALITY		
<p>Implement a dust abatement program. Contractors shall implement the following measures:</p> <ul style="list-style-type: none"> Water all active work areas, access roads and paths, parking areas, and staging areas at least twice daily during dry time periods (use of dust abatement products would not be allowed). Ensure that applied water does not enter the Merced River. Cover all trucks hauling dam debris and other loose materials that could spill onto paved surfaces, or require all trucks to maintain adequate freeboard. All paved areas that are subject to vehicle and pedestrian traffic shall be kept clean of debris and soils. Sweeping of these areas shall be implemented as necessary. Cover all stockpiles. Limit traffic speeds on unpaved roads and paths and around the project site. 	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities
<p>Implement vehicle emissions controls. Contractors shall implement the following measures:</p> <ul style="list-style-type: none"> Use California on-road diesel fuel for all diesel-powered equipment. Use equipment that is properly tuned and maintained in accordance with manufacturers' specifications. Avoid unnecessary emissions. Engines of trucks and vehicles in loading and unloading areas shall be turned off when not in use. 	National Park Service Project Manager Yosemite National Park Contractor	Concurrent with project activities

Public Involvement and Coordination

Public Involvement

Scoping History

The National Park Service conducted public scoping for the proposed action during Spring 2001. The Yosemite National Park Superintendent mailed a letter announcing the beginning of the planning process for removal of the Cascades Diversion Dam to individuals and organizations on the park's planning mailing list. The letter was also posted on the park's web site.

During the planning process, alternatives were developed that addressed dam removal and compliance with the Wild and Scenic Rivers Act of 1968, as amended (16 United States Code [USC] 1274[d]). Through scoping and the public comment review process on the Cascades Diversion Dam Removal Project Environmental Assessment, the planning process is being conducted in consultation with affected federal agencies, state and local governments, tribal groups, and interested organizations and individuals.

On-Site Public Meeting

On April 18, 2001, the National Park Service held an informal public scoping meeting to discuss the potential removal of Cascades Diversion Dam. The meeting included project orientation, group discussion, and a visit to the dam site to view the existing conditions. The purpose of the informal public scoping meeting was to: (1) provide participants with an overview of existing conditions and the proposed action; (2) ask participants to identify key issues that should be analyzed during the environmental review and compliance process; and (3) provide an opportunity for participants to ask questions regarding project alternatives and the overall environmental review and compliance process.

Results of Scoping

Scoping comments were received through April 27, 2001. As a result of the scoping effort, over 75 public scoping comments were elicited. All comments were reviewed and analyzed to determine public concerns. In addition, the National Park Service posts a project fact sheet and project planning updates on the park's web site. Project planning updates have also been presented at ongoing open house meetings and in the park's planning update newsletter. Based on public scoping comments, and applicable federal law, regulations, and executive orders, the National Park Service determined that an environmental assessment (not an environmental impact statement) would be the appropriate level of compliance for the Cascades Diversion Dam Removal Project. Public scoping comments, and issues raised by National Park Service staff, provided input used in the alternatives development process and in the analysis presented in this document.

Public Comment

The Cascades Diversion Dam Removal Project Environmental Assessment was released for a 30-day public review period beginning February 19, 2003 and closed March 24, 2003. In addition, the National Park Service held regular Open Houses during 2003 to disseminate information and collect informal written comments on the Cascades Dam Removal and other projects. Comments

received during the formal public comment period consisted of 22 letters, emails, and faxes from 23 individuals with a total of 81 comments. Issues raised included NEPA compliance, alternatives, bank stabilization, interpretation, aesthetics, and cumulative projects. None of the comments received introduced substantive new information nor raised any issues not fully considered in the Cascades Diversion Dam Removal Project Environmental Assessment. No modifications to the proposed action were made as a result of comments. A copy of the Cascades Diversion Dam Removal Project Environmental Assessment Summary of Public Comments and Responses is on file at Yosemite National Park and can be requested from the National Park Service at:

Mail: Superintendent, Yosemite National Park
ATTN.: Cascades Diversion Dam Removal Project
P.O. Box 577
Yosemite, California 95389

Fax: 209/379-1294
Email: Yose_Planning@nps.gov

Coordination

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers issued a Special Site Permit for the Cascades Diversion Dam Removal Project in conjunction with preparation of the *El Portal Road Improvements Environmental Assessment* in 1997. In December 2002, the National Park Service requested an extension on the timeline of the permit for dam removal activities. The extended permit would be valid only for actions related to dam removal, and would not be valid for actions regarding possible future El Portal Road improvements. In addition, the National Park Service notified the U.S. Army Corps of Engineers that the Cascades Diversion Dam Removal Project was a discrete project from the future El Portal Road Improvement Project and would not include road improvements. The Cascades Diversion Dam Removal Project will not be implemented until the extended permit is in place.

Central Valley Regional Water Quality Control Board

The National Park Service is in the process of applying for California Regional Water Quality Control Board Clean Water Act Section 401 Water Quality Certification. The National Park Service may be required to submit a report of waste discharge, and obtain Waste Discharge Requirements or an individual waiver. Copies of the existing waste discharge waiver are on file at Yosemite National Park. The Cascades Diversion Dam Removal Project will not be initiated until the certification is in place.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service has determined that the Cascades Diversion Dam Removal Project is not likely to adversely affect any threatened or endangered species or critical habitat (U.S. Fish and Wildlife Service Letter, March 10, 2003, Reference Number 1-1-03-I-1275).

California State Historic Preservation Officer

Cascades Diversion Dam has been the subject of previous evaluation and mitigation actions, as described at the beginning of this chapter. In 1986, the National Park Service evaluated the impacts associated with the demolition, relocation, and/or rehabilitation of all components of the Yosemite Hydroelectric Power Plant (also known as the Cascades Powerhouse). This evaluation included the removal of the dam. With the completion of this evaluation, the National Park Service completed the consultation process associated with Section 106 of the National Historic Preservation Act of 1966, as amended. As part of this process, the National Park Service signed a Memorandum of Agreement with the California State Historic Preservation Officer and the Advisory Council on Historic Preservation. A copy of the memorandum is located at the end of Chapter VI of the Cascades Diversion Dam Removal Project Environmental Assessment. A copy of the verification letter is also on file at Yosemite National Park. The National Park Service has complied with the various stipulations of the Memorandum of Agreement and has sent a letter to the State Historic Preservation Officer indicating that the Section 106 consultation process is complete. A letter of concurrence was received from the California State Historic Preservation Officer on March 18, 2003. The letter requested additional details regarding compliance with stipulations of the Memorandum of Agreement, but indicated there is no objection to any aspect of the notification regarding the adverse effects, provided the proposed mitigation measures are implemented (table 1-1). A copy of the verification letter is on file at Yosemite National Park.

Culturally Associated American Indians

The National Park Service conducted consultation with culturally associated American Indian tribes according to stipulations of the Programmatic Agreement and specific agreements. Between June 28, 2000 and July 17, 2000, National Park Service representatives met with representatives from seven tribal groups associated with Yosemite National Park. Since July of 2000 tribal consultation has been ongoing regarding concerns associated with the proposed project. Recently, the National Park Service requested that the Southern Sierra Mi Wuk identify plant gathering concerns for the river corridor between Cascades Diversion Dam and Cascades Picnic Area. The American Indian Council of Mariposa County submitted a letter of concurrence on March 24, 2003. The letter suggested additional details regarding bank and vegetation protection during project activities, but indicated there is no objection to any aspect of the notification regarding the adverse effects, provided the proposed mitigation measures are implemented (table 1-1). A copy of the verification letter is on file at Yosemite National Park.

Conclusion

Based on information contained in the Cascades Diversion Dam Removal Project Environmental Assessment as summarized above, the nature of comments received from affected agencies and the public, and the incorporation of the mitigation measures to avoid or reduce potential direct, indirect, and cumulative impacts, it is the determination of the National Park Service that the Proposed Action is not a major federal action that would significantly affect the quality of the human environment. No long-term adverse impacts to floodplains or wetlands would occur from the Proposed Action and the National Park Service finds the proposed action to be acceptable under Executive Order 11988 for the protection of floodplains and Executive Order 11990 for the protection of wetlands. Therefore, in accordance with the National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9), an environmental impact statement will not be prepared. The proposed action as detailed in the Cascades Diversion Dam Removal Project Environmental Assessment may be implemented as soon as practicable.

Recommended:



Superintendent, Yosemite National Park

5/12/03

Date

Approved:



Director Pacific West Region, National Park Service

5/16/03

Date

Errata for the Environmental Assessment

This section provides a catalog of the corrections and changes made to the Cascades Diversion Dam Removal Project Environmental Assessment since its original release for comment. Revised or new language is underlined. Deleted text is marked by strikethrough.

Comments received during the formal public comment period consisted of 22 letters, emails, and faxes from 23 individuals with a total of 81 comments. Issues raised included NEPA compliance, alternatives, bank stabilization, interpretation, aesthetics, and cumulative projects. None of the comments received introduced substantive new information nor raised any issues not fully considered in the Cascades Diversion Dam Removal Project Environmental Assessment. No modifications to the proposed action were made as a result of comments.

Where a change is made as part of a response to a comment on the Cascades Diversion Dam Removal Project Environmental Assessment, the comment number is noted in brackets at the end of the text change, see the Cascades Diversion Dam Removal Project Summary of Public Comments and Responses (NPS 2003).

Page II-7, Figure II-3 has been revised to show the northern edge of the bioengineered slope protection system in the vicinity of the intake structure (see following page). (Individual, Email. #10-3)

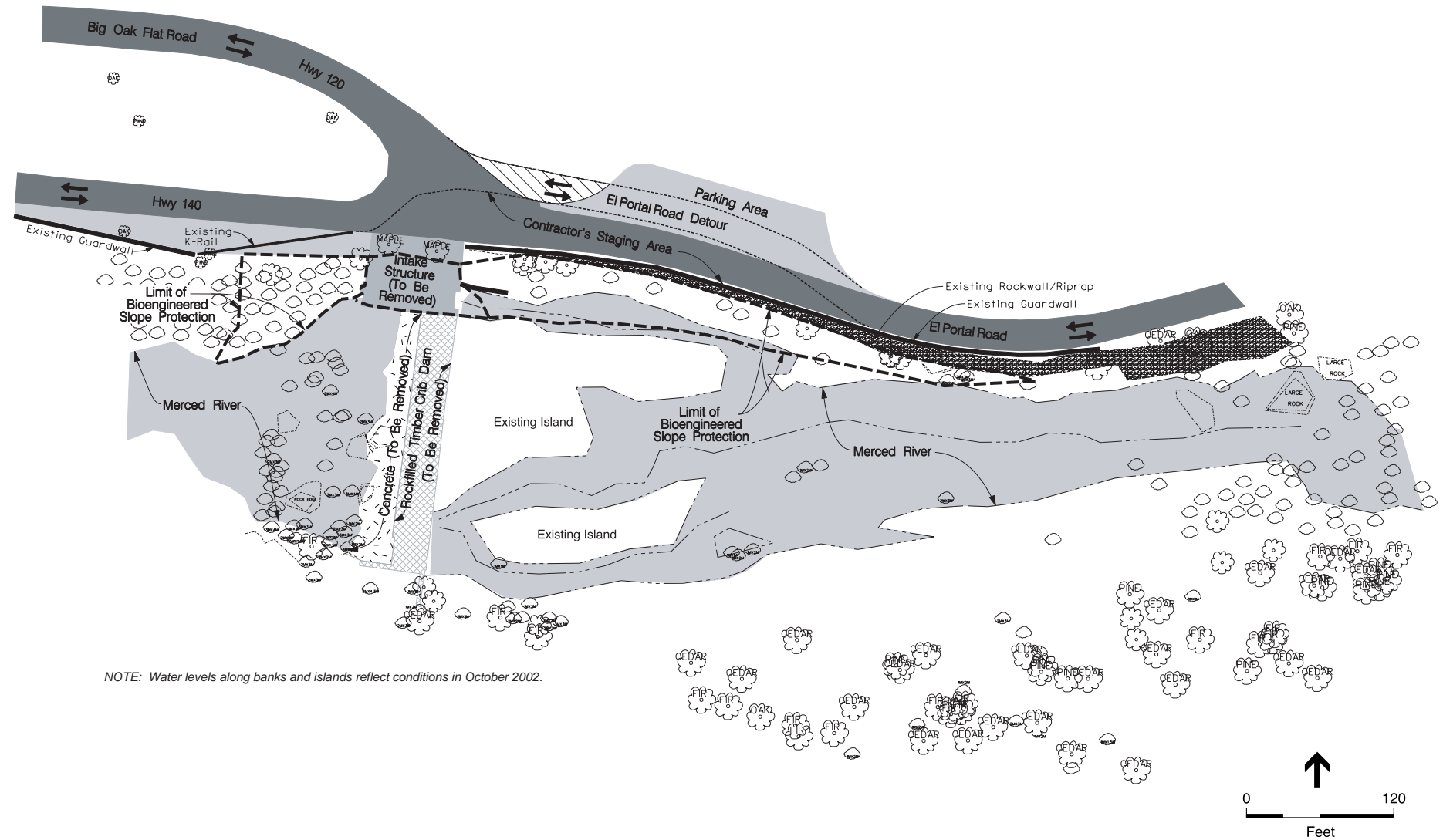
Page II-22, bullet 4 is revised as follows:

- Implement the requirements of the 1999 Agreement between the National Park Service and the American Indian Council or Mariposa County, Inc. for conducting traditional activities. In addition, consult with the American Indian Council of Mariposa County regarding appropriate plant species to be included in site restorations. (Tribal Organization, Mariposa, CA. #18-5)

Page II-22, Bullet 2 is revised as follows:

- Implement a dust abatement program. Contractors shall implement the following measures:
 - Water all active work areas, access roads and paths, parking areas, and staging areas at least twice daily during dry time periods (use of dust abatement products would not be allowed). Ensure that applied water does not enter the Merced River.
 - Cover all trucks hauling dam debris and other loose materials that could spill onto paved surfaces, or require all trucks to maintain adequate freeboard.
 - All paved areas that are subject to vehicle and pedestrian traffic shall be kept clean of debris and soils. Sweeping of these areas shall be implemented as necessary.
 - Cover all stockpiles.
 - Limit traffic speeds on unpaved roads and paths and around the project site.

Figure II-3
Alternative 2 - Complete Dam Removal



SOURCE: U.S. Department of Transportation, Federal Highway Administration, Central Federal Lands Highway Division 2002;
 Environmental Science Associates

Cascades Diversion Dam Removal Project Environmental Assessment

Page II-27 has been revised to add the following before Air Quality:

Special-Status Vegetation

- Protect the mature tanbark oak (park rare species) that is growing upslope from the river-left dam abutment from impacts during removal of the abutment. (Tribal Organization, Mariposa, CA. #18-4)

Page II-30, row 1 under Wetlands, Alternative 2 is revised as follows:

Dam removal activities would have a short-term impact to wetland and aquatic habitat resources associated with ground disturbance and the potential introduction of pollutants. However, dam removal activities would occur in a controlled manner, with the application of mitigation, reducing the adverse effect to a negligible intensity. Therefore, Alternative 2 would have a local, short-term, negligible, ~~beneficial~~ adverse effect on wetland and aquatic habitat compared to Alternative 1. Overall, Alternative 2 would result in a long-term, minor to moderate beneficial impact on the connectivity, function, and value of wetlands by enhancing free-flowing conditions of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented. The increase in fish and wildlife functional values that result from the restoration would also provide a long-term beneficial effect. Removal of Cascades Diversion Dam would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. Alternative 2 would result in a local, long-term, moderate, beneficial effect on wetland and aquatic resources compared to Alternative 1.

Page II-30, row 1 under Wetlands, Alternative 3 is revised as follows:

Dam removal activities would have a short-term impact to wetland and aquatic habitat resources associated with ground disturbance and the potential introduction of pollutants. However, dam removal activities would occur in a controlled manner, with the application of mitigation, reducing the adverse effect to a negligible intensity. Therefore, Alternative 3 would have a local, short-term, negligible, ~~beneficial~~ adverse effect on wetland and aquatic habitat compared to Alternative 1. Overall, Alternative 3 would result in a long-term, minor to moderate beneficial impact on the connectivity, function, and value of wetlands by enhancing free-flowing conditions of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented. The increase in fish and wildlife functional values that result from the restoration would also provide a long-term beneficial effect. Removal of the overflow portion of Cascades Diversion Dam and the river-left abutment would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. Alternative 3 would result in a local, long-term, minor to moderate, beneficial effect on wetland and aquatic resources compared to Alternative 1.

Page II-32, row 1 under Special-Status Species, Alternative 2 has been revised to add the following:

Eventual dam failure would likely result in the loss of several immature tanbark oak located adjacent to the river-left dam abutment, resulting in a local, long-term, minor, adverse impact to the range of this park-rare species within the park. The area would be replanted with tanbark oak.

Page III-10, paragraphs 1 through 3 are revised as follows:

The Cowardin system is used as the basis for wetland classification and protection by the National Park Service. The Cowardin system classifies wetlands based on the type of vegetative cover and lifeform, flooding regime, and substrate material. Jurisdictional wetlands are delineated and classified to meet regulations of Section 404 of the Clean Water Act. Cowardin wetlands include jurisdictional wetlands, but may also include certain nonvegetated sites lacking soil, if they meet specific criteria. A delineation of wetlands and water-associated habitats was conducted in the Spring of 2003 (Jones and Stokes 2003).

Wetlands in the Cascades Diversion Dam Project Area

Wetlands within the Cascades Diversion Dam project area are broadly classified as riparian in nature and include aquatic, riparian, and floodplain communities. The riparian zone is the plant community adjacent to a river or stream channel and serves as the interface between the river and the surrounding floodplain and upland communities. Riparian areas are characterized by the combination of high species diversity, high species density, and high productivity. Riparian plant communities are discussed in the Vegetation section, below.

Specific wetland classes identified within the project area are limited to riverine (rivers, creeks, and streams) and palustrine (shallow ponds, marshes, swamps, and sloughs). Using the Cowardin classification, specific wetland and deepwater classes within the project area include:

- *Riverine upper perennial* – 2.51 acres of main channel of the Merced River within the project area
- *Palustrine forest* – 0.26 acre riparian forest habitat along the Merced River subject to various flooding regimes within the project area
- *Palustrine scrub shrub* – 0.08 acre riparian scrub (e.g., willow) habitat along the Merced River subject to various flooding regimes within the project area
- *Palustrine emergent* – 0.03 acre riparian emergent (e.g., herbaceous species such as sedges and rushes) habitat along the Merced River subject to various flooding regimes within the project area

The following discussion provides general descriptions for each wetland class identified in the vicinity of the Cascades Diversion Dam.

Page III-11 has been revised to add the following, after paragraph 1:

Palustrine Emergent

Palustrine emergent habitat within the project area includes riverine emergent vegetation (e.g., herbs such as rushes and sedges). Within the project area, soils are sandy or silty and saturated for most of the year by the flow of the Merced River. Vegetation is dominated by grasses, sedges, rushes, and perennial herbs. This community is classified as wetland under both the National Park Service (Cowardin) and U.S. Army Corps of Engineers classification systems.

Page III-15, paragraph 3 is revised as follows:

A total of 55 special-status wildlife species and 298 special-status plant species (843 total) have been considered in the evaluation of this project (see Appendix D, Special-Status Species Evaluation). These species were identified based on data gathered from the National Park Service, the U.S. Fish and Wildlife Service (USFWS 2002), and the California Natural Diversity Data Base. The National Park Service has determined that 71 species (out of 83 total) are not known or likely to occur in the vicinity of the project area. In addition, preferred habitat for 71 species is also not likely to occur in the vicinity of the project area. The remaining species, the Wawona riffle beetle, harlequin duck, California spotted owl, and a number of special-status bat species, are described below.

Page III-19, paragraph 5 is revised as follows:

A total of 298 plant species that have special federal, state, or park status have been evaluated herein (see Appendix D, Special-Status Species Evaluation). Six plants are classified as federal species of concern (or federal species of local concern), one of which is also listed by the park as rare; three are listed as rare or threatened by the State of California; and the remaining 2049 are listed by the park as rare. ~~None of the plant species evaluated have been located within the project area.~~ One stand of park rare plant, the tanbark oak (*Lithocarpus densiflorus*), is located near the project area. This is the only stand of the tree variety of tanbark oak and one of 2 known stands of the shrub variety of the tanbark oak in Yosemite National Park. Several immature tanbark oaks are growing in the fill that supports the river-left dam abutment. One mature tanbark oak overhangs the river-left abutment, with its trunk outside the area of impact. The rest of the individuals in the stand are outside the area of potential impact of the dam removal.

Page III-24, paragraph 3 is revised as follows:

The National Park Service consults with American Indian people about management of park lands, especially regarding undertakings and park resources of concern. Some of the primary concerns are access to park areas; gathering of plant materials for food, medicinal, and utilitarian purposes; protection of archeological and burial sites; and interpretation of Indian culture and prehistoric and historic lifeways. The National Park Service is required to consult on the basis of Government-to-Government Relations with federally recognized Indian tribes, and on a more informal basis with nonfederally recognized tribes. There is no ethnographic information or direct historical data related to American Indian occupations at the Cascades Diversion Dam Removal Project area. People would most likely have passed through the area while traveling between Yosemite Valley and the lower elevations of the Merced River gorge, and ethnographic resources could occur within the project area and the gorge, such as plant material traditionally gathered for basketry, food, ceremonies, insect repellent, etc (NPS 2003a). Plants and materials that are or could be present within the project area and downstream include cottonwood trees, arroyo willow trees, willows, wormwood, sedge (bunch grass), and big leaf maple bracken fern, manzanita, bay leaf, clump grass, tulle reeds, and mushrooms (NPS 2003a).

Page IV-26, paragraph 4 is revised as follows:

Analysis

Special-status species known or likely to occur in the immediate vicinity of the Cascades Diversion Dam include Wawona riffle beetle, harlequin duck, California spotted owl, and nine species of bats, and tanbark oak (refer to Chapter III, Affected Environment, and Appendix D, Special-Status Species Evaluation, for additional information). The following subsections discuss impacts of Alternative 1 on these species and their habitat.

Page IV-27 is revised to add the following, to precede “Summary of Alternative 1 Impacts.”

Tanbark Oak. One mature tanbark oak, a park rare species, overhangs the river-left dam abutment and several immature tanbark oaks are found in the fill that supports the river-left dam abutment. Eventual dam failure would probably not result in the loss of this stand of tanbark oak because the right abutment is likely to be stable in the event of dam failure. Dam failure is expected to have a local, long-term, negligible, adverse impact to the range of this species within the park.

Page IV-28, paragraph 1 is revised as follows:

degrade and eventually fail, creating a local, short-term, moderate, adverse impact on individuals or habitat for Wawona riffle beetle and harlequin duck that occur downstream of the dam. In the impoundment area, eventual dam failure would return this area to a more natural condition, creating an overall local, long-term, minor to moderate, beneficial effect on Wawona riffle beetle and harlequin duck by increasing habitat for the species. Alternative 1 is unlikely to significantly affect special-status species of bats or the California spotted owl in the vicinity of Cascades Diversion Dam. There would be a negligible impact to of the stand of tanbark oak located adjacent to the river-left dam abutment because the abutment is likely to be stable in the event of dam failure.

Page IV-43, paragraph 4 is revised as follows:

Impairment

Alternative 1 would result in a short-term adverse impact, but a long-term beneficial impact to scenic resources within the Merced River corridor downstream to the Cascades Picnic Area. Although the Merced River is central to the corridor’s scenery, the short-term adverse effect of this alternative on scenic resources in the Merced River corridor would be primarily localized and of temporary duration and would not be considered severe. Scenic resources throughout the Merced River gorge downstream of the Cascades Picnic Area would remain unaffected. Therefore, Alternative 12 would not impair scenic resources.

Page IV-54, paragraph 5 is deleted, and the following paragraphs are added as follows:

Although wetland vegetation would re-stratify in relation to changes in the river channel following dam removal, there would be no long-term net loss of wetlands associated with implementation of Alternative 2. Following dam removal, the base level of the river is expected to drop at the dam site as the river stabilizes. As the base level of the river drops, the channel of the Merced River would narrow in the vicinity of the dam. As the river narrows, there would be a change in wetland habitat from riverine upper perennial wetland (currently

located in the main channel of the Merced River) to palustrine forest, scrub shrub, or emergent wetlands that would line the new, narrower river channel. Because the available floodplain would increase, link river-associated riparian vegetation that was fragmented by the dam, and enhance free-flowing conditions of the Merced River, there would be a local, long-term, minor to moderate beneficial impact on wetlands.

Implementation of Alternative 2 could result in a temporary reduction in the size of wetlands that line the Merced River channel as the bioengineered slope protection system is constructed. As the base level of the river drops and the river narrows after dam removal, the roots of wetland trees, shrubs, and herbaceous plants that are found on the margins of the main river channel in the vicinity of the dam could be farther from the water table, and some plants may not survive. The entire area from the margin of the Merced River to the top of the bank would be replanted as necessary with riparian plants to match upstream and downstream vegetation and at the appropriate proximity to the water table. There could be a temporary reduction in the size of palustrine emergent wetland, palustrine scrub-shrub wetland, and palustrine forested wetlands that line the Merced River channel, as wetland vegetation establishes in proximity to the new river channel. The site would be monitored for five years to determine the success of revegetation and natural recruitment of wetland vegetation. Based on monitoring results, additional planting may be necessary.

Overall, Alternative 2 would result in a local, long-term, minor to moderate beneficial impact on the connectivity, function, and value of wetlands by enhancing free-flowing conditions of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented. The increase in fish and wildlife functional values that result from the restoration would also provide a local, long-term minor beneficial impact for these resources.

~~Removal of Cascades Diversion Dam would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. The bioengineered bank stabilization would re-establish near-natural conditions similar to those upstream of the impoundment, where rocky riverbanks support riparian and upland vegetation. The revegetation would limit competition from weedy species, reduce potential for erosion and sedimentation, and help stabilize channel shape and slopes. Tree species would add structural diversity to the floodplain, and eventually become a source of large, woody debris. Alternative 2 would result in “no net loss” of wetland functions or values. The re-establishment of the riparian corridor along this portion of the river would have a local, long-term, minor to moderate, beneficial effect on wetland and aquatic resources in the vicinity of Cascades Diversion Dam compared to Alternative 1.~~

Page IV-55, paragraph 1 is revised as follows:

Summary of Alternative 2 Impacts. Dam removal activities would have a short-term impact to wetland and aquatic habitat resources associated with ground disturbance and the potential introduction of pollutants. However, dam removal activities would occur in a controlled manner, with the application of mitigation, reducing the adverse effect to a negligible intensity. Therefore, Alternative 2 would have a local, short-term, negligible, ~~beneficial~~ adverse effect on wetland and aquatic habitat compared to Alternative 1. Overall, Alternative 2 would result in a local, long-term, minor to moderate beneficial impact on the connectivity, function, and value of wetlands by enhancing free-flowing conditions of the Merced River at

this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented. The increase in fish and wildlife functional values that result from the restoration would also provide a local, long-term minor beneficial impact for these resources. Removal of Cascades Diversion Dam would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. Alternative 2 would result in a local, long-term, moderate, beneficial effect on wetland and aquatic resources compared to Alternative 1.

Page IV-57, paragraph 4 is revised as follows:

Analysis

Special-status species known or likely to occur in the immediate vicinity of the project area include Wawona riffle beetle, harlequin duck, California spotted owl, ~~and~~ nine species of bats, and tanbark oak (refer to Chapter III, Affected Environment, and Appendix D, Special-Status Species Evaluation, for additional information). The following subsections discuss impacts of Alternative 2 on these species and their habitat.

Page IV-58 is revised to add the following, to precede “Summary of Alternative 2 Impacts.”

Tanbark Oak. One mature tanbark oak, a park rare species, overhangs the river-left dam abutment. This mature tree would be protected during dam removal activities and would not be removed. Several immature tanbark oaks are found in the fill that supports the river-left dam abutment. These immature plants would be removed when the river-left abutment of the dam is removed. All other tanbark oaks in the vicinity would not be affected by the project. Under Alternative 2, tanbark oaks from the same gene pool would be planted in the abutment area to replace the immature oaks removed with the abutment. Because the tanbark oak appeared to colonize readily in the fill abutment, the oak is expected to re-establish in the same area. Alternative 2 would result in a local, short-term, minor, adverse impact on the special-status tanbark oak, as compared to Alternative 1.

Page IV-58, paragraph 3 is revised as follows:

Summary of Alternative 2 Impacts. Dam removal activities would have a short-term impact to special-status species associated with ground disturbance and the potential introduction of pollutants. However, dam removal activities would occur in a controlled manner, with the application of mitigation, reducing the adverse effect to a negligible intensity. Therefore, Alternative 2 would have a local, short-term, negligible, beneficial effect on special-status species compared to Alternative 1. Removal of Cascades Diversion Dam and revegetation would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing the biological integrity of this segment for Wawona rifle beetle and harlequin duck, resulting in a local, long-term, minor, beneficial effect on habitat for Wawona riffle beetle and harlequin duck at this location. The bioengineered bank stabilization and revegetation would have a local, long-term, negligible to minor, beneficial effect on habitat for special-status bats and California spotted owl at this location. Alternative 2 would result in a local, short-term, minor, adverse impact on the tanbark oak, a park-rare species.

Page IV-75, paragraph 3 is revised as follows:

Summary of Alternative 3 Impacts. Dam removal activities would have a short-term impact to wetland and aquatic habitat resources associated with ground disturbance and the potential introduction of pollutants. However, dam removal activities would occur in a controlled manner, with the application of mitigation, reducing the adverse effect to a negligible intensity. Therefore, Alternative 3 would have a local, short-term, negligible, beneficial effect on wetland and aquatic habitat compared to Alternative 1. Overall, Alternative 3 would result in a local, long-term, minor to moderate beneficial impact on the connectivity, function, and value of wetlands by enhancing free-flowing conditions of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented. The increase in fish and wildlife functional values that result from the restoration would also provide a local, long-term minor beneficial effect for these resources. Removal of Cascades Diversion Dam would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. Alternative 2 would result in a local, long-term, moderate, beneficial effect on wetland and aquatic resources compared to Alternative 1.

Page VII-1, List of Preparers and Reviewers is revised as follows:

Glen Rothell	<u>Project Management Administration</u>	B.S. Renewable Natural Resources	29 NPS
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Page VII-2, List of Preparers and Reviewers is revised to add the following:

<i>Federal Highways Administration</i>			
<u>Bart Bergendahl</u>	<u>Central Federal Lands Highways Division</u>	<u>Civil Engineer</u>	
<u>Christopher Longley</u>	<u>Central Federal Lands Highways Division</u>	<u>Hydraulic Engineer, PE</u>	
Pete Sletten	Central Federal Lands Highways Division	Registered Professional Engineer B.S. Civil Engineering	8 FHWA 16 other
<u>Rick West</u>	<u>Central Federal Lands Highways Division</u>	<u>Civil Engineer, PE</u>	

Page VII-3 is revised to add the following:

<i>PBS&J</i>			
<u>Jeff Sickles</u>	<u>Hydraulic Modeling</u>	<u>Civil Engineer, PE</u>	
<u>Steve Smith</u>	<u>Hydraulic Modeling</u>	<u>Civil Engineer, PE</u>	

Page IX-2 is revised to add the following:

Jones & Stokes

2003 Exhibit A, Waters of the United States, Including Wetlands, Cascades Dam Site, Yosemite National Park, California. April 25.

Page IX-4 is revised to add the following:

PBS&J
2003 Technical Memorandum: Cascade Dam Removal Project, Ordinary High
Water Estimates and HEC-RAS Modeling.

Page B-9, Flood storage (detention storage) is revised as follows:

Flood storage (detention storage)	Flood storage of the Merced River in the vicinity of the impoundment would be increased. The impoundment provides minimal flood storage and does not regulate high water. Removal of the dam would remove the minimal flood storage capacity of the impoundment. Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper.
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(State Agency, Stockton, CA. #14-4), (Conservation Organization, Mariposa, CA. #23-21)

Page D-1, paragraph 1 has been revised as follows:

A total of 55 special-status wildlife species and ~~298~~ special-status plant species were considered in the evaluation of the Cascades Diversion Dam Removal Project (see Table D-1). These special-species include those listed under the federal Endangered Species Act of 1973, as amended (USFWS 2002), species listed under the California Endangered Species Act or accorded “special status” (i.e., considered rare or sensitive by the California Department of Fish and Game), and park rare plants. The purpose of this document appendix is to:

- Evaluate the effects of the proposed action on special-status species or their critical habitat that are known to be or could be present within the project area
- Determine the need for consultation and conference with the U.S. Fish and Wildlife Service
- Conform to requirements of the Endangered Species Act (19 United States Code [USC] 1536 [c], 50 Code of Federal Regulations [CFR] 402) and the National Environmental Policy Act, 42 USC 4321 et seq., implemented at 40 CFR Parts 1500-1508)

Page D-1, paragraph 3 is revised as follows:

The National Park Service has determined that several of the ~~843~~ special-status species listed in Table D-1 warrant further consideration in the body of this environmental assessment, the Wawona riffle beetle, a number of special-status bat species, harlequin duck, ~~and~~ California spotted owl, and tanbark oak. The remaining 71 special-status species do not occur in the project area and there would be no direct, indirect, or cumulative effect on these species from actions proposed in the alternatives. These species are not evaluated further in this environmental assessment.

Page D-17 has been revised to add the following:

Tanbark oak <i>Lithocarpus</i> <i>desiflorus</i>			PR	Found in dry shaded canyons in the mixed conifer zone.	Considered Further in this Analysis. Suitable habitat for this species occurs within the vicinity of Cascades Diversion Dam.
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Cascades Diversion Dam Removal Project

Yosemite National Park

Lead Agency: National Park Service

Merced Wild and Scenic River Section 7 Determination

Introduction

Purpose of this Determination

The purpose of this determination is to evaluate the impact of the proposed Cascades Diversion Dam Removal Project on the free-flowing condition and the Outstandingly Remarkable Values for which the Merced River was designated Wild and Scenic.

Authority

The authority for this determination is found in Section 7(a) of the Wild and Scenic Rivers Act (Public Law 90-542, as amended, 16 United States Code 1271-1278). Section 7(a) states:

...no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.

While the Wild and Scenic Rivers Act does not prohibit development along a river corridor, it does specify guidelines for the determination of appropriate actions within the bed and banks of a Wild and Scenic River. As the designated river manager for the Merced River segments located within the boundaries of Yosemite National Park and the El Portal Administrative Site, the National Park Service must carry out a Section 7 determination on all proposed water resources projects¹ to ensure they do not directly and adversely impact the free-flowing condition or the values for which the river was designated.²

¹ A water resources project is any dam, water conduit, reservoir, powerhouse, transmission line, or other works project under the Federal Power Act, or other developments, that would affect the free-flowing characteristics of a wild and scenic or congressionally authorized study river. In addition to projects licensed by the Federal Energy Regulatory Commission, water resources project may include: dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction projects, bank stabilization projects, channelization projects, levee construction, boat ramps, fishing piers, and activities that require a Section 404 permit from the U.S. Army Corps of Engineers (Interagency Wild and Scenic Rivers Coordinating Council 1999).

² This description of the Wild and Scenic Rivers Act Section 7 determination process is adapted from a technical report by the Interagency Wild and Scenic Rivers Coordinating Council (Interagency Wild and Scenic Rivers Coordinating Council 1999).

Wild and Scenic River Designation

In 1987, the U.S. Congress designated the Merced River a “Wild and Scenic River” to protect the river’s free-flowing condition and to protect and enhance its unique values for the benefit and enjoyment of present and future generations (16 United States Code 1271). This designation gives the Merced River special protection under the Wild and Scenic Rivers Act.

The passage of Public Law 100-149 on November 2, 1987 and Public Law 102-432 on October 23, 1992 placed 122 miles of the main stem and South Fork of the Merced River, including the forks of Red Peak, Merced Peak, Triple Peak, and Lyell, into the Wild and Scenic River System. The National Park Service manages 81 miles of the Merced Wild and Scenic River, encompassing both the main stem and the South Fork in Yosemite National Park and the El Portal Administrative Site. The U.S. Forest Service and the Bureau of Land Management administer the remaining 41 miles of the designated river.

Methodology

The Wild and Scenic Rivers Act Section 7 Determination for the Cascades Diversion Dam Removal Project is based on guidance provided in the *Wild and Scenic Rivers Act: Section 7 Technical Report, Appendix C, Evaluation Procedure under “Direct and Adverse”* (Interagency Wild and Scenic Rivers Coordinating Council 1999). The “direct and adverse” evaluation procedure is carried out for water resources projects licensed by the Federal Energy Regulatory Commission or other federally assisted water resources projects within the Wild and Scenic River boundary of the designated river. Cascades Diversion Dam is within the bed and banks of the Merced River. All proposed activities would occur within the Wild and Scenic boundary of the Merced River. The Section 7 determination process applies only to the proposed action.

Protection and Enhancement of Outstandingly Remarkable Values

Section 7 of the Wild and Scenic Rivers Act requires river managing agencies to determine whether water resources projects would adversely affect free flow or directly and adversely impact Outstandingly Remarkable Values. In addition, Section 10(a) of the act requires that rivers be administered to protect and enhance Outstandingly Remarkable Values. Outstandingly Remarkable Values are the river-related values that make the river segment unique and worthy of special protection. Uses that are consistent with this provision and that do not substantially interfere with public enjoyment and use of these values should not be limited (16 United States Code 1281[a]). Outstandingly Remarkable Values located outside the Wild and Scenic River corridor boundary must also be protected (NPS 2001a).

The Merced Wild and Scenic River segments applicable to the Cascades Diversion Dam Removal Project are 3A (Impoundment), 3B (Gorge), and 4 (El Portal). For the purposes of this analysis of potential effects on Outstandingly Remarkable Values, the proposed action is compared to the No Action Alternative (see Chapter II, Alternatives). The focus of the analysis is on long-term effects (e.g., effects that would last 10 years or more or would be permanent). Short-term effects are not addressed in this analysis unless they are of sufficient magnitude (having a substantial, highly noticeable influence) to warrant consideration.

Analysis of Outstandingly Remarkable Values is focused on segment-wide effects, rather than site-specific or localized effects. Exceptions to the segment-wide guideline include site-specific

activities that could have substantial effects on Outstandingly Remarkable Values, such as degradation of habitat of a river-related special-status species (a biological Outstandingly Remarkable Value) that is endemic to that location. For the Cascades Diversion Dam Removal Project, Outstandingly Remarkable Values are evaluated based on effects to such values within the Impoundment, Gorge, and El Portal segments of the Merced Wild and Scenic River.

In terms of evaluating potential effects, actions that could degrade Outstandingly Remarkable Values on a segment-wide basis include actions with effects that would be discernible throughout the majority of the river segments, or would be of sufficient magnitude to affect adjacent segments.

For the purposes of this analysis under Sections 7 of the act, the following assumptions for each Outstandingly Remarkable Value were made:

Scientific: The analysis considers whether the proposed action would affect the integrity of the Merced Wild and Scenic River as a scientific resource, or would degrade the river's value for research (all segments).

Scenic: The analysis considers the specific features that are listed in the scenic Outstandingly Remarkable Value for the Gorge segment and potential effects to views are analyzed from the perspective of a person situated on the riverbank or on the river (Gorge segment).

Geologic Processes/Conditions: The analysis gives primary consideration to designated processes and those processes (e.g., U-shaped valley, hanging valleys, evidence of glaciation, etc.) that have been responsible for creating the river's geologic landscape. Effects related to natural meandering of the Merced River are addressed in the hydrologic processes Outstandingly Remarkable Value (all segments).

Recreation: The analysis considers whether opportunities to experience a spectrum of river-related recreational activities would be affected (Gorge and El Portal segments).

Biological: The analysis focuses on effects to riparian areas, wetlands, and other riverine areas that provide rich habitat for a diversity of river-related species (all segments).

Cultural: The analysis considers effects to river-related cultural resources that are not intended to divert the free flow of the river and are either eligible for or listed on the National Register of Historic Places, including archeological sites, which provide evidence of thousands of years of human occupation and current traditional use sites. The analysis also considers effects on nationally significant historic resources, such as designed landscapes and developed areas, historic buildings, and circulation systems (trails, roads, and bridges) that provide visitor access to the sublime views of natural features that are culturally valuable (Gorge and El Portal segments).

Hydrologic Processes: Consideration is primarily given to designated processes, such as river meandering, world-renowned waterfalls, an active flood regime, oxbows, and fluvial processes. Effects on wetlands are addressed in the biological Outstandingly Remarkable Value (Gorge and El Portal segments).

It is possible for Outstandingly Remarkable Values to be in conflict with each other, or for an action to have beneficial impacts with regard to one Outstandingly Remarkable Value and adverse impacts with regard to other Outstandingly Remarkable Values. The Merced River Plan recognizes this possibility, and states (page 32):

Actions must protect all Outstandingly Remarkable Values, regardless of where they are located. When Outstandingly Remarkable Values lie within the boundary of the Wild and Scenic River, the value must be protected and enhanced. When values are in conflict with each other, the net effect to Outstandingly Remarkable Values must be beneficial.

The Wild and Scenic Rivers Act stipulates that agencies are given discretion to manage a river system with “varying degrees of intensity for its protection and development, based on the special attributes of the area.” For example, there may be conflicts between protecting cultural resources and hydrologic processes, as is the case with a historic bridge that constricts the flow of the river.

Compatibility with Classifications

The Cascades Diversion Dam Removal Project was assessed for its compatibility with the Merced Wild and Scenic River recreational and scenic classifications.

Consistency with the River Protection Overlay

The Cascades Diversion Dam Removal Project was assessed for its consistency with the River Protection Overlay prescriptions. The River Protection Overlay includes the Merced Wild and Scenic River channel itself, and extends 150 feet on both sides of the river, measured from the ordinary high-water mark above the Cascades Powerhouse and 100 feet on both sides of the river, measured from the ordinary high-water mark below the Cascades Powerhouse.

Consistency with Management Zoning

The Cascades Diversion Dam Removal Project was assessed for its consistency with the Merced River Plan management zoning and the corresponding zoning prescriptions. The management zones applicable to the Cascades Diversion Dam Removal Project include:

- Discovery (2B) north of the river in the Impoundment segment
- Open Space (2A) south of the river in the Impoundment segment

Cascades Diversion Dam Removal Project Wild and Scenic Rivers Act Section 7 Determination

Table 2-1 presents the Section 7 evaluation for the Cascades Diversion Dam Removal Project.

Table 2-1
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
DEFINE THE PROPOSED ACTIVITY	
Project proponent	National Park Service, Yosemite National Park
Purpose and need for the project	<p>The purpose of the Cascades Diversion Dam Removal Project is to remove an unnatural obstruction on the Merced River and to restore the river's natural free-flowing condition. This removal project is consistent with the Wild and Scenic River guidance provided in the Merced River Plan and will meet the direction of the <i>Yosemite Valley Plan</i>, which calls for the dam's removal.</p> <p>The Cascades Diversion Dam is classified as a high hazard structure (USBR 1997). It is in unsatisfactory condition due to flood damage experienced in 1997 and continuing deterioration associated with age. In addition, the dam no longer serves a useful purpose – water is not diverted from the site to generate electricity or for other uses, and the impoundment does not regulate high water. Removal of the existing dam structure is necessary to prevent possible uncontrolled and sudden failure, which could result in a release of impounded water and the deposition of concrete and timber debris, grouted rockfill, and impounded sediment along the downstream channel. Such an occurrence could pose a considerable threat to valued resources (such as aquatic life, scenic views, and recreational opportunities), infrastructure (El Portal Road, wastewater, telephone, and electrical lines), and human life.</p> <p>In addition, the National Park Service is entrusted to conserve and restore park values. This includes protecting the biological and physical processes that created the park, along with scenic features, natural landscapes, and native plants and wildlife. The removal of the dam would work toward fulfilling this mandate by restoring this segment of the Merced River.</p>
Geographic location of the project	Cascades Diversion Dam is located on the main stem of the Merced River in Yosemite National Park, near the intersection of El Portal Road and Big Oak Flat Road (UTM coordinates 11 263647E 4177777N, approximately river mile 120). Refer to figures I-1 and II-1 of the Cascades Diversion Dam Removal Project Environmental Assessment.
Project description	<p>The proposed action includes complete removal of the dam, the dam abutments, the intake structure, and the screenhouse, and restoration of the related river channel located beneath the dam site. Sediment (including rocks and boulders) in the area upstream of the dam would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Natural river processes would continue to transport remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover incrementally over time as sediments are transported from the impoundment area. Following removal of the river-right abutment, intake structure and screenhouse, the river-right bank would be stabilized using a bioengineered bank stabilization system to prevent erosion of the river-right bank. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent river bank segments.</p> <p>Refer to the description of the preferred alternative (Alternative 2) in the Cascades Diversion Dam Removal Project Environmental Assessment.</p> <p>Upon project completion, the river segment through the damsite would be restored to natural conditions and reclassified from recreational to scenic.</p>

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Duration of the proposed activities	In-channel work, bank stabilization, and revegetation would be completed within a two- to three-month period during the fall of 2003 (September through November) when the flow of the Merced River is typically lowest (less than 200 cubic feet per second). The overall project duration would be approximately five months. Natural transport of up to approximately 9,600 to 15,600 cubic yards of impounded sediment (including rocks/boulders) could be transported with high riverflows during the winter or spring of 2004.
Magnitude and/or extent of the proposed activities	Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter IV, Environmental Consequences for detailed data concerning potential impacts of the proposed action.
Mitigation	The proposed action is designed to restore free-flow and natural fluvial processes of the Merced River. The proposed action would protect Outstandingly Remarkable Values from possible damage due to continued degradation and eventual failure of the dam, improve the free-flowing condition of the river, and restore natural fluvial processes in the vicinity of the dam. Mitigation (e.g., best management practices and resource-specific measures) is incorporated into the proposed action. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives for mitigation measures incorporated into the proposed action.
Relationship to past and future management activities	The <i>Yosemite Valley Plan</i> calls for removal of the Cascades Diversion Dam. The Cascades Diversion Dam Removal Project is consistent with the Wild and Scenic River guidance provided in the Merced River Plan. Implementation of the proposed action would alter management of this river segment from an unnatural impoundment to management of a free-flowing river segment.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER WITHIN-CHANNEL CONDITIONS	
The position of the proposed activity relative to the streambed and streambanks	Cascades Diversion Dam is located within the bed and banks of the Merced River. Dam removal activities would occur within the bed and banks of the Merced River as well.
Any likely resulting changes in:	
Active channel location	Removal of the Cascades Diversion Dam will eliminate an existing human-made structure that affects the natural flow of the Merced River. Currently, the impoundment created by the dam has unnaturally widened the channel of the Merced River to approximately twice its natural width. Once the dam is removed, the channel of the Merced River would be expected to naturally narrow and deepen immediately upstream of the dam as impounded sediments, including rocks/boulders (up to approximately 9,600 to 15,600 cubic yards), wash downstream. A more natural channel configuration within the bed and banks of the Merced River would result from the proposed action.
Channel geometry (cross-sectional shape, width, depth characteristics)	Once the dam is removed, a portion of remaining sediment (including rocks/boulders) not removed by mechanical means (up to approximately 9,600 to 15,600 cubic yards) would be transported downstream with winter or spring riverflows. Sediment present behind the dam includes a rock and sediment island that was present before the dam was constructed; rock, cobble, and sediments that were excavated during dam construction and left in place upstream of the dam; and sediment that has accumulated since construction of the dam (Kennedy/Jenks 2002). Some of this material would likely remain in the existing impoundment area following dam failure, and it is expected that the island upstream of the dam would remain relatively stable given its presence prior to dam construction.

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Channel geometry (cross-sectional shape, width, depth characteristics) (cont.)	<p>Sediments are expected to wash downstream within the first year after dam removal (Kennedy/Jenks/Chilton and ROMA Design Group 1988). Sediment transport is expected to be highest in March and April during spring snowmelt. Sediment concentrations are expected to range from 60 milligrams per liter (October through February) to 160 milligrams per liter (spring). Sands and gravels would likely settle out near Cascades Picnic Area. Less than 1% of the material impounded behind the dam is finer than 0.07 millimeter in diameter. The fine material would be transported downstream and would be deposited in areas of low-flow energy, such as pools and downstream reservoirs.</p> <p>The channel of the Merced River would be expected to naturally narrow and deepen as impounded sediments wash downstream. There would be a progressive lowering of the base level of the river channel until the river reach attains equilibrium. Water levels are expected to lower slightly at the upstream end of the impoundment, up to approximately 10 feet in some locations immediately upstream from the existing dam. The island upstream from the dam would likely remain. Local scour would occur at the slope where the diversion dam was located, and is expected to develop into a channel incision that would proceed upstream (headcut) through the impoundment.</p>
Channel slope (rate or nature of vertical drop)	<p>Due to the nature of the material in the channel – primarily boulders, cobbles, and gravels – little or no channel incision is anticipated upstream of the present impoundment. The final bed profile would likely be a smooth slope connecting the reach downstream of the dam to the reach upstream of the dam. The final bed slope in the vicinity of the dam would be approximately 3%.</p>
Channel form (straight, meandering, or braided)	<p>Meander in the reach is anticipated to be minor, since the incision would tend to follow the channel course that existed prior to dam construction in 1917 (Kennedy/Jenks/Chilton and ROMA Design Group 1988; Kennedy/Jenks 2002). Channel adjustment would be episodic, with periods of incision followed by sediment storage and then renewed incision. The channel is expected to stabilize at or near its natural level over a period of years (Kennedy/Jenks/Chilton and ROMA Design Group 1988).</p>
Relevant water quality parameters (turbidity, temperature, nutrient availability)	<p>Because less than 1% of the material is finer than 0.07 millimeter in diameter, turbidity impacts to the river would likely be small and would be mitigated through application of best management practices. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. The largest increase of turbidity above background values (Chapter III, Affected Environment, Alluvial Processes) would likely occur the first time the river flows through the sediments formerly impounded by the dam. This rise in turbidity would probably last on the order of a few hours. After the initial rise in turbidity, there may be smaller spikes in turbidity as flood flows pass through the impoundment region and gradually erode more sediment and expose the fine material. However, each successive turbidity spike should be smaller than the previous one until the turbidity levels return to normal.</p> <p>Water temperature is expected to decrease (compared to existing conditions) immediately upstream of the dam as the channel deepens and riparian vegetation matures. Nutrient availability would be enhanced as the newly established riparian corridor matures.</p>
Navigation of the river	<p>River navigation as defined by the U.S. Army Corps of Engineers is not applicable to this section of the river. Only 20 miles of the Merced River, from its confluence with the San Joaquin River, is designated as navigable by the U.S. Army Corps of Engineers.</p>

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER RIPARIAN AND/OR FLOODPLAIN CONDITIONS	
The position of the proposed activity relative to the riparian area and floodplain	Cascades Diversion Dam is located within the bed and banks of the Merced River – below ordinary high water and within the 2.33- and 100-year floodplain.
Any likely resulting changes in: Vegetation composition, age structure, quantity, or vigor	<p>There would be no long-term changes in vegetation composition, age structure, quantity or vigor within the project area, although the stratification of vegetation in proximity to the river would change to more natural conditions, similar to upstream and downstream riparian vegetation patterns. Upon completion of the project, the base level of the river is expected to drop at the dam site as the river stabilizes. As the base level of the river drops, the channel of the Merced River would narrow in the vicinity of the dam. As the river narrows, wetland trees, shrubs, and herbaceous plants would be planted and grow adjacent to the narrower river channel.</p> <p>There could be a temporary reduction in the size of wetlands that line the Merced River channel as the bioengineered slope protection system is constructed and wetland vegetation establishes in proximity to the new river channel. In addition, the roots of riparian plants that line the existing river channel in the vicinity of the dam could be farther from the water table, and the plants could become stressed or die. As part of the site restoration, native wetland species would be planted and re-established in proximity to the new river channel to match upstream and downstream riparian vegetation patterns. In time, the vegetation composition, age structure, quantity, and vigor of vegetation in the project site is likely to be the same as of vegetation that existed prior to the project, and prior to construction of the dam. In addition, riparian vegetation would be linked throughout the former dam site.</p>
Relevant soil properties such as compaction or percent bare ground	Downstream deposition of up to approximately 9,600 to 15,600 cubic yards of natural impounded sediment (including rocks/boulders) would enhance floodplain soils in the vicinity of Cascades Picnic Area. Sediment reconfiguration and site restoration and stabilization would reduce erosion and increase the protection of the river-right bank from unnatural accelerated erosion, resulting in a local, long-term, minor to moderate, beneficial impact on soils.
Relevant floodplain properties such as width, roughness, bank stability, or susceptibility to erosion	Downstream sediment deposition would enhance floodplain soils in the vicinity of Cascades Picnic Area. Sediment reconfiguration and site restoration and stabilization would reduce erosion and increase the protection of the river-right bank and adjacent roadway, resulting in a local, long-term, minor to moderate, beneficial impact on floodplain values and functions. The proposed action would have a beneficial impact on floodplain values by enhancing the free-flowing condition of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER UPLAND CONDITIONS	
The position of the proposed activity relative to the uplands	The proposed action is located within the bed and banks of the Merced River. Staging for dam removal is the only activity planned for upland areas. The primary staging area would occupy a currently paved portion of Big Oak Flat Road. Traffic on this portion of the road would be diverted temporarily around the staging area through an existing paved parking area. Pohono Quarry would be used as a secondary staging area for storage of equipment used infrequently during project activities and for storage and sorting of material that would be reused within the park, recycled, or disposed outside the park.

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Any likely resulting changes in: Vegetation composition, age structure, quantity, or vigor	There would be no measurable effect to age, vigor, quantity, structure, or composition of upland vegetation. The proposed action is located within the bed and banks of the Merced River. Staging areas are located in previously disturbed and paved areas adjacent to the river and at Pohono Quarry.
Relevant soil properties such as compaction or percent bare ground	There would be no measurable effect to upland soil resources. Upon completion of the project (approximately five months), the existing earthen embankment, El Portal Road, and the existing paved parking area would be restored to pre-project conditions.
Relevant hydrologic properties such as drainage patterns or the character of surface and subsurface flows	<p>There would be no measurable effect to upland hydrologic properties. No portion of the proposed action, including equipment staging, dam removal activities, or materials storage, would be located within or otherwise affect surface or subsurface drainage patterns from the uplands to the Merced River.</p> <p>Removal of the overflow portion of the dam and river-left abutment would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing its hydrologic integrity. At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. As this occurs, the localized water table is expected to drop and the existing narrow band of palustrine forest could transition to an upland community. Reconfiguration of impounded sediment, bank stabilization, and revegetation would minimize lateral movement of the channel and decrease erosion.</p>
Potential changes in upland conditions that would influence archeological, cultural, or other identified significant resource values	Construction access and staging would occur on previously disturbed and paved surfaces. Dam removal would be performed in accordance with stipulations in the parkwide 1999 Programmatic Agreement and the 1986 Memorandum of Agreement. The proposed action would not influence archeological, cultural, or other identified significant resource values in uplands of the Merced River.
EVALUATE AND DESCRIBE WHETHER CHANGES IN ON-SITE CONDITIONS CAN OR WILL ALTER EXISTING HYDROLOGIC OR BIOLOGIC PROCESSES	
The ability of the channel to change course, re-occupy former segments, or inundate its floodplain	The project would restore more natural riverflow conditions in the project area. Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper – occupying a channel similar to what existed prior to dam construction. The floodplain would be enhanced by reconfiguration of impounded sediment, bank stabilization, and revegetation. No element of the proposed action would have negative long-term effects on the Merced River.
Streambank erosion potential, sediment routing and deposition, or debris loading	Removal of the dam and attendant structures (dam abutments and intake structure) would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing fluvial processes. Natural sediment transport would no longer be impeded by the dam. Reconfiguration of impounded sediment, bank stabilization, and revegetation in the area of the impoundment would minimize lateral movement of the channel and decrease erosion.
The amount or timing of flow in the channel	The flow of the Merced River would no longer be impeded by the dam. Streamflow in the vicinity of the impoundment would increase, consistent with upstream and downstream conditions.
Existing flow patterns	Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper – similar to the pre-dam channel. Free flow would be re-established along this reach of the Merced River.

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Surface and subsurface flow characteristics	As the channel of the Merced River narrows and deepens, the localized water table is expected to drop, consistent with upstream and downstream conditions.
Flood storage (detention storage)	The impoundment provides minimal flood storage and does not regulate high water. Removal of the dam would remove the minimal flood storage capacity of the impoundment. Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper.
Aggregation and or degradation of the channel	Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper. Up to approximately 9,600 to 15,600 cubic yards of impounded natural sediment (including rocks/boulders) would be deposited downstream between the dam and the Cascades Picnic Area – a beneficial effect for floodplain soils and values.
Biological processes such as:	
Reproduction, vigor, growth, and/or succession of streamside vegetation	At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. As this occurs, the localized water table is expected to drop, and the existing narrow band of palustrine forests could transition to an upland community. Up to approximately 5,400 cubic yards of impounded sediment would be reconfigured on the river-right bank and stabilized with native river rock, consistent with upstream and downstream channel conditions, to provide substrate for riparian restoration. The size, connectivity, and integrity of wetlands in the project area, particularly palustrine forest and riverine habitat, would be enhanced. Palustrine forest would be expanded, and contribution of nutrients, organic matter, and shade to the riverine system would be increased. The proposed action would result in net increase of wetland extent, functions, and values.
Nutrient cycling	Nutrient cycling of riparian vegetation in the vicinity of the impoundment would be increased, due to the enhanced and expanded riparian zone on the river-right and river-left banks that would result from the drop in the localized water table and restoration along the river-right bank.
Fish spawning and/or rearing success	Removal of Cascades Diversion Dam would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing the biological integrity of this segment for native fish and wildlife. Dam removal would alter approximately 1.18 acres of wetland and aquatic habitat upstream of the dam. The proposed action includes complete removal of all man-made structures that currently exist within the bed and banks of the Merced River – below ordinary high water and within the 2.33- and 100-year floodplain. It includes removal of 4,570 cubic yards or 0.54 acre of reinforced concrete and backfill associated with the dam, the dam abutments, the intake structure, and the screenhouse. It also includes excavation of 5,400 cubic yards or 0.26 acre of naturally occurring sediment, and placement of 5,400 cubic yards or 0.32 acre of fill for bank stabilization restoration of the related river channel located beneath the dam site. At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. The island that occurs behind the dam is a natural feature of the river and is likely to remain. Water temperature through this reach would decrease, and oxygen levels would be expected to increase. Sediment deposition downstream of the dam could have short-term adverse effects on fisheries (e.g., suspended sediments would temporarily reduce dissolved oxygen levels). The application of best management practices would reduce the potential adverse impacts to fisheries to a negligible intensity. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. Sediment deposition could also have long-term beneficial effects on fisheries (sediment deposition could result in larger sandbars, creating backwater niches).

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Riparian-dependent avian species needs	There would be a beneficial impact on the connectivity, function, and value of wetlands by enhancement of the free-flowing conditions of the Merced River in the project site. The available floodplain would be increased in this narrowly constricted portion of the river and river-associated riparian vegetation that has been degraded and fragmented would be linked. The increased functional values that result from the restoration would provide a localized long-term benefit for riparian-dependent avian species.
Amphibian/mollusk needs	In-channel removal-related activities could result in short-term impacts to amphibians or mollusks at the site of the impoundment. Mitigation measures (e.g., best management practices, species-specific monitoring) would reduce the identified effects to a negligible intensity. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. Because downstream transport and deposition of impounded sediments are not expected to rise above normal background levels, the proposed action would not adversely affect species downstream of the dam. Over the long term, channel and riparian restoration would increase habitat for species of amphibians and mollusks native to the Merced River.
Species composition (diversity)	The proposed action would result in beneficial impacts on the connectivity, function, and value of wetlands by enhancement of the free-flowing conditions of the Merced River in the project site. Species composition would return to similar conditions to the natural patterns that existed prior to construction of the dam. Species diversity would be respond to a natural river system, rather than an artificial impoundment. This would enhance natural species composition in the area.

ESTIMATE THE MAGNITUDE AND SPATIAL EXTENT OF POTENTIAL OFF-SITE CHANGES

Consider and document:

Changes that influence other parts of the river system	Indirect effects of the proposed action include downstream deposition of up to approximately 9,600 to 15,600 cubic yards of sands and gravels between the dam and the Cascades Picnic Area. Sediment at Cascades Picnic Area could have an approximate thickness of 0.3 to 2.1 feet. In addition, the proposed action could transport fine grained sediment to areas of low-flow energy, such as pools and downstream reservoirs. The proposed action would restore free-flow and natural fluvial processes to this reach of the Merced River. Deposition of sands and gravels in the vicinity of Cascades Picnic Area would enhance (negligible) floodplain soils. Turbidity and dissolved oxygen levels would be temporarily decreased (while sediments are in suspension), but not above normal background levels. Fine material deposited in downstream pools and reservoirs would have no perceptible effect.
The range of circumstances under which off-site changes might occur (for example, as may be related to flow frequency)	Downstream transport and deposition of impounded sediments is expected to occur during the winter or spring runoff of 2004. The positive effect of enhanced free flow would be realized immediately following dam removal.
The likelihood that predicted changes will be realized	The changes associated with the proposed action described above would be realized.
Specify processes involved, such as water and sediment, and the movement of nutrients	Natural fluvial processes such as free flow, sediment transport, and nutrient exchange would be enhanced upon completion of the proposed action.

Table 2-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
DEFINE THE TIME SCALE OVER WHICH STEPS 3-6 ARE LIKELY TO OCCUR	
Review steps 3-6, looking independently at the element of time. Define and document the time scale over which the effects will occur.	In-channel work, bank stabilization, and revegetation would be completed within a two- to three-month period during the fall of 2003 (September through November) when the flow of the Merced River is typically lowest (less than 200 cubic feet per second). The overall project duration would be approximately five months. Natural transport of up to approximately 9,600 to 15,600 cubic yards of impounded sediment (including rocks/bounders) would be transported with high riverflows during the winter or spring of 2004. The positive effect of enhanced free flow would be realized immediately following dam removal.

Outstandingly Remarkable Values

Outstandingly Remarkable Values are the river-related values that make the river segment unique and worthy of special protection. They form the basis for the river's designation as a Wild and Scenic River. Outstandingly Remarkable Values identified for the Impoundment (3A), Gorge (3B), and El Portal (4) segments include:

- Scientific
- Scenic
- Geologic Processes/Conditions
- Recreation
- Biological
- Cultural
- Hydrologic Processes

The proposed action would include use of Pohono Quarry, located within the Valley segment, as a secondary staging area. The quarry is not located within the bed and banks of the Merced River and is currently used for staging for ongoing park operations. The proposed action includes site-specific mitigation measures and the application of best management practices and will not result in off-site impacts within the Valley segment. Therefore, the Valley segment is not included in the analysis of effects of the proposed action on Outstandingly Remarkable Values.

Effects of the Proposed Action on Outstandingly Remarkable Values

The proposed action would remove the Cascades Diversion Dam and attendant structures, restoring the free-flowing condition of the Merced Wild and Scenic River and returning this portion of the river to a more natural state, thereby enhancing its integrity. Table 2-2 describes the effects of the proposed action on each of the Outstandingly Remarkable Values that apply to the Impoundment, Gorge, and El Portal river segments. As indicated in table 2-1, the proposed action would have a beneficial effect on the biological and hydrologic processes Outstandingly Remarkable Values. The proposed action would not result in any changes to the current level of protection and enhancement of the scientific, scenic, geologic processes, recreation, and cultural Outstandingly Remarkable Values. As a result, the proposed action would protect the Outstandingly Remarkable Values of the Merced Wild and Scenic River.

Table 2-2**Effects of the Proposed Action on Outstandingly Remarkable Values in the Impoundment, Gorge, and El Portal Segments of the Merced Wild and Scenic River Corridor**

Outstandingly Remarkable Value	Effects of the Proposed Action
<p><i>Scientific</i> – The entire river corridor constitutes a highly significant scientific resource because the river watershed is largely within designated Wilderness in Yosemite National Park. Scientific Outstandingly Remarkable Values relate to the Merced River’s value for research. This Outstandingly Remarkable Value applies to all the Merced River segments.</p>	<p>The proposed action would have no effect on scientific resources of the river. Removal of Cascades Diversion Dam would not affect the Merced River’s value for research. Therefore, scientific values of the river would continue to be protected and enhanced.</p>
<p><i>Scenic</i> – The Gorge segment provides views from the river and its banks of the Cascades, spectacular rapids among giant boulders, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock.</p>	<p>The proposed action would remove the dam and attendant structures from the Merced River corridor that intrude visually upon the scenic character of this area. Removal of the dam would not result in the loss of river-viewing opportunities or views of the Cascades, rapids, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock. The proposed action would avoid the deposition of dam debris in the river channel and the associated gouging of the riverbanks and channel, which could diminish the scenic Outstandingly Remarkable Values under the No Action Alternative. Because the dam structures do not dominate the natural landscape from any viewpoint, removal of the dam would contribute negligibly to the enhancement of the scenic Outstandingly Remarkable Value. The proposed action would continue to protect and enhance the scenic Outstandingly Remarkable Value on a segment-wide basis.</p>
<p><i>Geologic Processes/Conditions</i> – The Impoundment segment contains the dramatic transition from the U-shaped, glaciated Yosemite Valley to the V-shaped river gorge. The Gorge segment is characterized by a classic V-shaped river gorge with a continuous steep gradient. The El Portal segment contains a transition from igneous to metasedimentary rocks (metasedimentary rocks are among the oldest in the Sierra Nevada).</p>	<p>The proposed action would have no effect on the geologic process Outstandingly Remarkable Value. Removal of Cascades Diversion Dam would not affect the transition from the U-shaped valley to the V-shaped river gorge, the V-shaped gorge itself, or the transition from igneous to metasedimentary rocks. These values would continue to be protected and enhanced.</p>
<p><i>Recreation</i> – The Gorge segment provides a spectrum of river-related recreational opportunities, such a picnicking, fishing, photography, and sightseeing. The El Portal segment also provides a range of river-related recreational opportunities, in particular white-water rafting and kayaking (class III to V) and fishing.</p>	<p>The proposed action would remove a public safety hazard to river-related park users, including those picnicking, fishing, taking photographs, and sightseeing in the Gorge segment and those engaging in river-related recreational opportunities in the El Portal segment. The proposed action would preserve the recreational values on a segment-wide basis. Overall, the proposed action would have no net effect on the recreation Outstandingly Remarkable Value for the Gorge and El Portal segments.</p>
<p><i>Biological</i> – The Impoundment segment contains rich riparian habitat. The Gorge segment is characterized by diverse riparian areas and associated special-status species that are largely intact and almost entirely undisturbed by humans. The El Portal segment contains riverine habitats such as riparian woodlands and associated federal and state special-status species, including Tompkin’s sedge and Valley elderberry longhorn beetle and its critical habitat (elderberry shrub). Expanses of north-facing habitat allow unlimited access to the riparian zone for wildlife species.</p>	<p>The rich riparian habitat in the area would be protected and enhanced. Riparian habitat in the existing project area is dependent on an artificial impoundment. After dam removal and restoration, riparian habitat would depend and respond to the natural dynamics of a free-flowing river. Vegetation would stratify in response to the new river channel, but there would be no net loss of riparian habitat as a result of the proposed action. There could be a temporary reduction in the size of wetlands that line the Merced River channel, as wetland vegetation establishes in proximity to the new river channel.</p>

Table 2-2 (Continued)
Effects of the Proposed Action on Outstandingly Remarkable Values in the Impoundment, Gorge, and El Portal Segments of the Merced Wild and Scenic River Corridor

Outstandingly Remarkable Value	Effects of the Proposed Action
<i>Biological (continued)</i>	<p>Continued dam deterioration and eventual failure under the No Action Alternative could result in extensive erosion, as well as uncontrolled debris release into the Merced River that could affect downstream riparian habitat and special-status species in the Gorge and El Portal segments. The proposed action would avoid these impacts to biological resources.</p> <p>Overall, implementation of the proposed action would slightly increase the level of protection and enhancement of the biological Outstandingly Remarkable Values of the Impoundment, Gorge, and El Portal segments because the proposed action would have a long-term, minor to moderate, beneficial effect on the Outstandingly Remarkable Values for these segments.</p>
<p><i>Cultural</i> – There are no cultural Outstandingly Remarkable Values in the Impoundment segment. The Gorge segment contains cultural resources, including prehistoric sites and historic sites and structures such as those relating to historic engineering projects. The El Portal segment contains some of the oldest archeological sites in the Yosemite area, as well as many historic Indian villages and traditional gathering places. River-related historic resources include structures related to early tourism and industrial development.</p>	<p>Although Cascades Diversion Dam is a historic resource that contributes to the cultural landscape as an element of the Yosemite Hydroelectric Power Plant, the dam is not considered an Outstandingly Remarkable Value for Wild and Scenic Rivers Act purposes because it was intended to obstruct the river's free flow. As a result, the Impoundment segment does not have any cultural Outstandingly Remarkable Values. Because the dam is not considered an Outstandingly Remarkable Value, removal of the dam would not affect the downstream cultural Outstandingly Remarkable Values in the Gorge segment.</p> <p>Controlled removal of the dam and bank stabilization would avoid potential downstream erosion and dam debris impacts to the Gorge and El Portal segments associated with the No Action Alternative. Further, any actions would be performed in accordance with the park's 1999 Programmatic Agreement. As a result, archeological resources throughout the remainder of the Merced River corridor would not be affected. Therefore, implementation of the proposed action would preserve archeological resources included as cultural Outstandingly Remarkable Values within the Gorge and El Portal segments.</p> <p>Bank stabilization and revegetation would increase bank integrity and decrease potential erosion, therefore avoiding adverse dam debris and erosion-related effects within the Gorge and El Portal segments described under the No Action Alternative. Ethnographic resources throughout the remainder of the Merced River corridor downstream of the dam would not be affected. In addition, the park would continue to consult with culturally associated American Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. Therefore, implementation of the proposed action would preserve ethnographic resources included as cultural Outstandingly Remarkable Values within the Gorge and El Portal segments.</p>

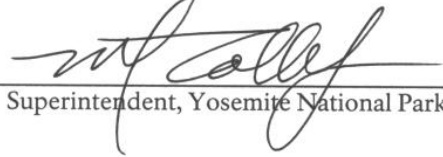
Table 2-2 (Continued)
Effects of the Proposed Action on Outstandingly Remarkable Values in the Impoundment, Gorge, and El Portal Segments of the Merced Wild and Scenic River Corridor

Outstandingly Remarkable Value	Effects of the Proposed Action
<p><i>Cultural</i> (Continued)</p> <p><i>Hydrologic Processes</i> – The Gorge segment is characterized by exceptionally steep gradients (2,000-foot elevation drop in approximately six miles). The El Portal segment is characterized by continuous rapids.</p>	<p>Under the proposed action, the dam would be removed in a controlled manner, compared to uncontrolled failure under the No Action Alternative. The controlled removal of the dam, performed in accordance with stipulations in the park's 1999 Programmatic Agreement, would avoid impacts to other Gorge segment cultural landscape resources, including elements of the Yosemite Hydroelectric Power Plant, the Merced Canyon Travel Corridor, and the Coulterville Stage Road. Nationally significant historic resources throughout the remainder of the Merced River corridor, such as designed landscapes and developed areas, historic buildings, and circulation systems (trails, roads, and bridges), would be unaffected, including those within the El Portal segment.</p> <p>Overall, implementation of the proposed action would preserve the cultural values within the Gorge and El Portal segments and would have no net effect on the cultural Outstandingly Remarkable Value for the Gorge and El Portal segments.</p> <p>Dam removal activities could adversely affect water quality. This short-term effect would be reduced to a negligible intensity by the application of best management practices. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action.</p> <p>Under the proposed action, Cascades Diversion Dam would be removed, thus restoring the free-flowing condition of the Merced River and returning this portion of the river to a more natural state, thereby enhancing its natural hydrologic regime. Implementation of a bioengineered bank stabilization system on the river-right bank would minimize lateral movement of the channel and decrease erosion, thereby protecting the bank, and would result a net increase in the floodplain at the site of the impoundment. Removing Cascades Diversion Dam would help restore the active flood regime and hydrologic processes. The removal of the dam would eliminate constriction of riverflow and improve the natural hydrologic regime. Implementation of the proposed action would have a long-term beneficial effect on hydrologic processes that influence river morphology.</p> <p>Therefore, the proposed action would protect and enhance the hydrologic processes Outstandingly Remarkable Values in the El Portal segment and would slightly increase the level of protection and enhancement of the hydrologic processes Outstandingly Remarkable Values in the Gorge segment.</p>

Section 7 Determination

The proposed action would remove a human-made structure from the bed and banks of the Merced Wild and Scenic River. Free-flow and natural fluvial processes (e.g., sediment transport, fish passage) would be returned to a more natural condition. Upon dam removal, the channel of the Merced River would naturally narrow and deepen. The floodplain in the immediate vicinity of the impoundment would be enlarged and stabilized. Riparian and floodplain connectivity, functions, and values would be enhanced. The proposed action would have a beneficial effect on the biological and hydrologic processes Outstandingly Remarkable Values. The proposed action would not affect the scientific, scenic, geologic processes, recreation, and cultural Outstandingly Remarkable Values. The National Park Service concludes that the proposed action would enhance free-flow of the Merced River and would not have any direct and adverse effects on the Outstandingly Remarkable Values for which the river was designated Wild and Scenic.

Recommended:



Superintendent, Yosemite National Park

5/12/03
Date

Approved:



Regional Director Pacific West Region, National Park Service

5/16/03
Date

Cascades Diversion Dam Removal Project

Yosemite National Park
Lead Agency: National Park Service

Wetland Statement of Findings for the Cascades Diversion Dam Removal Project

Recommended:



Superintendent, Yosemite National Park

5/12/03

Date

Certification of Technical Adequacy and Servicewide Consistency:



Acting Chief Water Resources Division
or Professional Wetland Scientist, National Park Service

5/14/03

Date

Approved:



Regional Director Pacific West Region, National Park Service

5/16/03

Date

Purpose of this Statement of Findings

The purpose of this Wetland Statement of Findings is to review the Cascades Diversion Dam Removal Project in accordance with Executive Order 11990 (Protection of Wetlands) and NPS Procedural Manual 77-1: Wetland Protection. This Statement of Findings reviews the Cascades Diversion Dam Removal Project in sufficient detail to:

- Avoid, to the extent possible, the short-and long-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative
- Describe the effects on wetland values associated with the proposed action
- Provide a thorough description and evaluation of mitigation measures developed to achieve compliance with Executive Order 11990 (Protection of Wetlands) and NPS Procedural Manual 77-1: Wetland Protection
- Ensure “no net loss” of wetland functions or values

Affected Wetlands

Wetland Extent

Wetlands¹ and deepwater habitats within the project area include the riverine habitat of the Merced River and the narrow border of riparian palustrine forest on the river-right and river-left banks. A total of 2.88 acres of riverine and palustrine habitat occur within the project area. See attached Figure 3-1 (Jones and Stokes 2003).

Wetland Characteristics




Specific wetland classes identified within the project area are limited to riverine (rivers, creeks, and streams) and palustrine (shallow ponds, marshes, swamps, and sloughs). Using the Cowardin classification, specific wetland and deepwater classes within the project area include:

- *Riverine upper perennial* – 2.51 acres of main channel of the Merced River within the project area
- *Palustrine forest* – 0.26 acre of riparian forest habitat along the Merced River subject to various flooding regimes within the project area
- *Palustrine scrub shrub* – 0.08 acres of riparian scrub (e.g., willow) habitat along the Merced River subject to various flooding regimes within the project area
- *Palustrine emergent* – 0.03 acre riparian emergent (e.g., herbaceous species such as sedges and rushes) habitat along the Merced River subject to various flooding regimes within the project area


The size, connectivity, and integrity of wetlands in the project area, particularly palustrine forest and riverine habitat, have been directly compromised by the dam and El Portal Road, which constrict the floodplain of the Merced River in the immediate area of the dam, and alter hydrologic flows. The majority of wetland acreage in the project area is classified as riverine

¹ Consistent with NPS Procedural Manual 77-1: Wetland Protection, wetlands herein are described using the Cowardin classification system.

WATERS OF THE UNITED STATES **AREA (ACRES)**

Wetlands		
	PEM Palustrine Emergent Wetland	0.03
	PBS Palustrine Scrub-Shrub Wetland	0.08
	PFO Palustrine Forested Wetland	0.26


Other Waters of the United States


	R3UB Riverine Upper Perennial Unconsolidated Bottom	2.51
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Total Jurisdictional Acreage **2.88**

CD-01 Jurisdictional Feature Label


⊕ DP-01 Delineation Data Point

 Merced River Ordinary High Water Mark (OHWM)
(Baseline for Merced River RPO Zone)

 River Protection Overlay (RPO)



N



1" = 40'

CONTOUR INTERVAL: 1 m


Polygon/Line Feature Identification Number	Cowardin Habitat Class	Area (acres)
CD-01	PFO	0.20
CD-02	PEM	0.03
CD-03	PBS	0.08
CD-04	PFO	0.06
CD-05	R3UB	2.08
CD-06	R3UB	0.45

NOTE:
Topographic Base Map: Federal Highway Administration.

DRAWN BY: JBN/C		SCALE: 1"=40' CONTOUR INTERVAL: 1	
CHECKED BY: JB		DATE: 4/9/03	
DWG NO.: EK_A_Ceresado.DWG		JOB NO.: 00118-00-002	
STATUS: PRELIMINARY (50% DRAFT)		SHEET NO.: 1 OF 1	
DATE VERIFIED: TO BE DETERMINED		CORPS REGULATORY #: TO BE DETERMINED	

REV.	DATE	DESCRIPTION	BY	APPROVED
4-3-00		Revision of R3UB boundary on north side	VR	JB

PREPARED BY:



Contact: Joel Butterworth
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upper perennial and includes the open and flowing water of the Merced River, as well as the permanently flooded channel with little in-stream vegetation. The Merced River within the impoundment formed by the dam is approximately twice as wide as the natural channel upstream and downstream of the dam. In the impoundment, the river is shallower and warmer, without the variety of riffles and deep pools needed to sustain aquatic life that is typical of a free-flowing river.

Palustrine forest wetlands dominated by black cottonwood, white alder, and willows are restricted to a narrow border along both shores. On the river-right shore, riparian vegetation is constricted between the river and the roadway. Palustrine scrub shrub wetlands are present sporadically within this narrow border. Willows dominate these wetlands. On the river-left, this zone is constricted between the widened channel in the impoundment and naturally steep topography. Riverside vegetation overhanging the main channel is absent in many locations and contributes only minimal nutrients, organic matter, or shade to the riverine system. Reduction in the riparian band has increased bank erosion, resulting in a further loss of stabilized soils capable of supporting riparian species.

The floodplain upstream of the impoundment is slightly wider and characterized by varied topography; hummocks and depressions create diverse habitats, which in turn yield greater plant species diversity. Adjacent to the water, a mixture of small-fruited bulrush, sedge, beaked sedge, and a variety of rush species share the wettest sites. Sandbar willow, red willow, and arroyo willow are all present in the near-bank area of the floodplain. Low pockets are densely populated with recently germinated willow and cottonwood seedlings, probably resulting from the January 1997 flood. Bare soils are being colonized by horsetail, dogbane, and goldenrod. A variety of grass species, including hairgrass, reed grass, and brome, occur throughout the floodplain. Inflated sedge is concentrated between 1 and 5 feet above the water level. White alder is sparse and corresponds roughly with the bankfull mark.

The floodplain within the impoundment is almost entirely located on the river-left side of the Merced River. The river-right side of the river has a narrow, steep riparian area constricted by El Portal Road, with only a narrow band suitable for supporting wetland plant species. The floodplain on the river-left bank is restricted due to the impoundment and shading from steep, north-facing cliffs. The dominant willow species is red willow, with sandbar willow and arroyo willow intermixed. Black cottonwood and white alder are minor components. Herbaceous species include small-fruited bulrush, various species of sedge and rush, horsetail, dogbane, and goldenrod. Approximately 30% of the floodplain within the impoundment area upstream from the dam is bare soil, likely a result of deposition from the flood of January 1997.

The Merced River gorge downstream of the impoundment is steep, with a narrow floodplain band of riparian vegetation along the river course. Isolated pockets of willow, white alder, and oaks characterize the riparian corridor in this area.

Existing Structures in Wetlands

Cascades Diversion Dam is located within the bed and banks of the Merced River. The overflow portion of the dam spans the riverine channel of the Merced River. The river-right and river-left abutments and the intake structure are located within the river channel and palustrine forest zone.

Environmental Consequences of the Proposed Action on Wetlands

Analysis

Alternative 2 includes complete removal of all dam-related structures that currently exist within the bed and banks of the Merced River below the ordinary high water and within the 100-year floodplain. The dam structure and associated intake structure would be removed from an approximately 0.15 acre area. An additional area, approximately 0.43-acre, would be excavated in the vicinity of the dam structure to remove some sediments trapped behind the structure and accommodate equipment access. Removal of the sediments will reduce the amount of material that will erode and travel downstream once the structure is removed. The total proposed restoration area is 0.58 acre. Naturally occurring rock and sediments removed from the vicinity of the dam would be repositioned over a 0.32 acre total fill area to stabilize the river-right bank and decrease the potential for sediment erosion. The surface of the stabilization fill will be planted with riparian/wetland, woody and herbaceous vegetation.

Upon completion of the project, the base level of the river is expected to drop at the dam site as the river stabilizes. As the base level of the river drops, the channel of the Merced River would narrow in the vicinity of the dam to the width of the river before the dam was constructed. As the river narrows, there would be a change from riverine upper perennial wetland (currently located in the main channel of the Merced River) to palustrine forest, scrub shrub, or emergent wetlands that would line the narrower river channel. Overall, there would be no net loss in wetland acreage, and wetland habitat and functions would return to the natural conditions that existed before the dam.

As the base level of the river drops and the river narrows after dam removal, the roots of wetland trees, shrubs, and herbaceous plants that are found on the margins of the main river channel in the vicinity of the dam could be farther from the water table, and some plants may not survive. The entire area from the margin of the Merced River to the top of the bank would be replanted with riparian plants to match upstream and downstream vegetation and at the appropriate proximity to the water table. There could be a temporary reduction in the size of palustrine emergent wetland, palustrine scrub-shrub wetland, and palustrine forested wetlands that line the Merced River channel, as wetland vegetation establishes in proximity to the new river channel. The site would be monitored for five years to determine the success of revegetation and natural recruitment of vegetation. Based on monitoring results, additional planting may be necessary.

In addition, there would be short-term adverse effects on related to heavy equipment and dam removal activities to wetland habitat in the vicinity of the dam. Effects would be related to heavy equipment and dam removal activities and could include soil compaction, dust, vegetation removal, root damage, erosion, and introduction and spread of non-native species. The addition of silt, the resuspension of sediment, or the introduction of pollutants (e.g., fuels, lubricants) related to dam removal operations could degrade the quality of native wetland and aquatic habitats in the immediate vicinity of the dam. The application of mitigation measures described below (e.g., best management practices) would reduce the potential adverse impacts to wetland and aquatic habitats to a negligible intensity.

In the long term, removal of Cascades Diversion Dam would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing the hydrological and biological integrity of associated wetlands. A variety of riffles and deep pools would form in the area of the existing impoundment upstream of the dam. This would create more suitable habitat for fish and wildlife found in free-flowing rivers and link habitat that was fragmented by the dam. There would be a small net gain in the area of the floodplain. Special-status species potentially found in the project area include Wawona riffle beetle, nine species of bats, harlequin duck, and California spotted owl. There would be a local, long-term, minor, beneficial impact on habitat for the Wawona riffle beetle and harlequin duck due to the restoration of free-flowing conditions and increase in swift water habitat. There would be a local, long-term, negligible to minor, beneficial impact on special-status bat species and California spotted owl due to the increased habitat associated with the bioengineered bank stabilization and revegetation. With the applicable of mitigation measures, negligible impacts on special-status species are expected during dam removal activities.

The bioengineered bank stabilization and revegetation would be designed to match upstream and downstream conditions. The revegetation would limit the introduction of weedy species, reduce the potential for erosion and sedimentation, and help stabilize channel shape and slopes. Native tree species would add structural diversity to the floodplain, and eventually become a source of large, woody debris. Dam removal would result in “no net loss” of wetland functions or values. The re-establishment of the riparian corridor along this portion of the river would have a long-term, minor to moderate, beneficial effect on wetland and aquatic resources in the vicinity of Cascades Diversion Dam. Under Alternative 1, the No Action Alternative, Cascades Diversion Dam would remain and continue to adversely affect the integrity, connectivity, and size of wetlands in the immediate vicinity of the dam. Though actions proposed in Alternative 2 (preferred) would take place in wetlands, the actions would result in long-term beneficial impacts on wetlands.

Cumulative Impacts

Cumulative effects to wetland and aquatic resources discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Merced River corridor in combination with potential effects of this alternative. The projects identified below include those projects that have the potential to affect local wetland patterns (i.e., within the river corridor) as well as regional wetland patterns related to the Merced River.

Wetland and riparian systems of the Merced River corridor have been substantially altered by development and visitor activities. These changes have negatively influenced the size, form, and function of wetlands and the plants, wildlife, and aquatic species that inhabit them. Implementation of the *Yosemite Valley Plan* is an example of an approved plan that could have adverse or beneficial effects on wetlands. Full implementation of the *Yosemite Valley Plan* would restore 141 acres of river-associated wetlands in Yosemite Valley – a long-term, major, beneficial effect. While some of the past, present, and future projects in the Merced River watershed could have short-term, construction-related, adverse impacts to wetland resources, overall the cumulative projects would increase the size, connectivity, and integrity of wetland resources within the watershed, resulting in a long-term, major, beneficial cumulative effect on wetland and aquatic resources. Past, present, and reasonably foreseeable future projects in combination with dam removal would have a net long-term, major, beneficial effect on wetland patterns within the Merced River corridor.

Conclusions

Removal of Cascades Diversion Dam would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. Alternative 2 would result in a local, long-term, moderate, beneficial effect on wetland and aquatic resources. Past, present, and reasonably foreseeable future projects in combination with Alternative 2 would have a net long-term, major, beneficial effect on wetland patterns within the Merced River corridor.

Alternatives Considered

Alternatives considered in the Cascades Diversion Dam Removal Project Environmental Assessment (Chapter II, Alternatives) include the No Action Alternative, Complete Dam Removal, and Partial Dam Removal.

Alternative 1: No Action

Alternative 1, the No Action Alternative, would allow Cascades Diversion Dam to remain in its existing condition; maintenance or repair would occur only to protect human health and safety. Considered to be in unsatisfactory condition and classified as a high-hazard structure (USBR 1997), failure of the overflow portion of the dam is considered inevitable. An uncontrolled and sudden failure of the overflow portion of the structure would result in a release of impounded water and the deposition of concrete and timber debris, grouted rockfill, and impounded sediment along the downstream channel. Dam debris – concrete, timbers, and grouted rockfill – would litter the downstream channel of the Merced River. All or portions of the existing concrete abutment structures on both banks and the intake structure would likely remain following failure of the overflow structure. Up to approximately 20,000 to 25,000 cubic yards of dam-related debris and sediment would wash downstream.

Alternative 2: Complete Dam Removal (Preferred)

Alternative 2 includes complete removal of the dam, the dam abutments, the intake structure, and the screenhouse, and restoration of the related river channel located beneath the dam site (see figure II-3 of Chapter II, Alternatives). Approximately 4,400 to 5,400 cubic yards of naturally occurring rock and sediments would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Figure II-4, located in Chapter II, Alternatives, indicates the river profile at Cascades Diversion Dam before and after removal of the dam structure and sediments. Natural river processes would continue to transport the remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover incrementally over time, as sediments are transported from the impoundment area. However, the rate of natural channel recovery and restoration would be monitored to determine if additional restoration actions were necessary. Following removal of the river-right abutment, intake structure, and screenhouse, the river-right bank would be stabilized using a bioengineered bank stabilization system to prevent erosion of the river-right bank. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent riverbank segments.

Alternative 3: Partial Dam Removal

Alternative 3 includes complete removal of the dam, the river-left dam abutment, and the screenhouse on the river-right intake structure, and restoration of the related river channel located beneath the dam site (see figure II-3 of Chapter II, Alternatives). Under this alternative, the river-right dam abutment and intake structure would be retained for use as a river viewing platform. Approximately 4,400 to 5,400 cubic yards of naturally occurring rock and sediments would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Figure II-4, located in Chapter II, Alternatives, indicates the river profile at Cascades Diversion Dam before and after removal of the dam structure and sediments. Natural river processes would continue to transport the remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover incrementally over time, as sediments are transported from the impoundment area. However, the rate of natural channel recovery and restoration would be monitored to determine if additional restoration actions were necessary. Following removal of the dam and screenhouse, the river-right bank would be stabilized upstream and downstream of the intake structure using a bioengineered bank stabilization system to prevent erosion of the river-right bank. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent riverbank segments.

Site Restoration

The last phase of the action alternatives would be site restoration. Once the dam and attendant structures are removed, the riverflow characteristics in the area are expected to change. The approach channel immediately upstream of the dam would undergo gradual degradation from increased flow velocities. The river is expected to cut a channel through the remaining impounded sediments, narrowing and deepening the river channel. The river would divide into a river-right and river-left channel around the existing island above the dam site. The decrease in riverbed elevation would necessitate the placement of bank slope protection on the river-right side of the channel (USBR 2001).

Exposed soil would be covered with a combination of locally acquired native duff and forest litter from adjacent riparian sites to provide immediate groundcover and facilitate natural revegetation of the site. On the river-right bank, a bioengineered slope protection system would be installed to protect the riverbank from erosion (see figure II-3 of Chapter II, Alternatives). The bioengineered slope protection would be constructed of native riparian vegetation and boulders and designed to match the natural conditions of upstream and downstream riverbanks to the extent possible (see figure II-5 of Chapter II, Alternatives).

The bioengineered bank stabilization system would be constructed using standard techniques, including brush layering incorporated into a boulder structure. Other materials could be incorporated, including logs and root wads. Boulders would not be grouted into place. Approximately 4,400 to 5,400 cubic yards of excavated sediment (including native river rocks/boulders) would be reconfigured on the river-right bank and incorporated into the bioengineered bank stabilization system. Sediments excavated during dam removal are expected to generate enough rock and sediment to meet the needs of the river-right bank stabilization system. No imported rock fill or riprap would be used (USBR 2001). Equipment used to perform

restoration activities could include excavators, bulldozers, loaders, cranes, dump trucks, pumps, and water trucks. Restoration would be consistent with the project's U.S. Army Corps of Engineers Special Site Permit (refer to Chapter VI, Consultation and Coordination).

The project area would be contoured and finished with sediments to facilitate both natural and assisted revegetation. Native riparian wetland species that characterize the site-specific conditions of the Cascades Diversion Dam area would be planted. Appropriate planting prescriptions for riparian revegetation have been developed, including appropriate plant species and their placement in relation to Merced River water levels. Species suitable to be planted adjacent to the water would include a variety of rush species (such as small-fruited bulrush, sedge, and beaked sedge), intermixed with willows (including sandbar willow, red willow, and arroyo willow). Other species planted in this area may include horsetail, dogbane, and goldenrod. Herbaceous species would be re-established through hand-application of locally acquired mulch from adjacent sites supporting these species and hand-application of seeds, minimizing the potential for introduction of non-native species. Species such as white alder seedlings would be planted within the bioengineered slope at the bankfull mark. Wetland trees such as black cottonwood and bigleaf maple cuttings would be planted near the upper limits of the riparian zone to match adjacent riparian vegetation patterns.

The site would be monitored in July (when maximum biomass is present, and to ensure the correct identification of herbaceous species) for five years to determine the success of the revegetation. Based on monitoring results, additional planting or stabilization could be required, including mulching, seeding, and planting of seedlings and cuttings. Any non-native plant species would be removed as discovered. Successful revegetation would establish a self-sustaining cover of native species that stabilize soil, trap sediment, provide wildlife habitat, and fulfill other basic functions of riparian ecosystems. The natural regeneration of vegetation would be deemed successful if, after five years, the herbaceous species composition and cover is within 90% of the composition and cover of adjacent native riparian areas, and if the stem density of shrubs and trees is within 90% of natural stem densities of adjacent areas. In addition, river channel morphology and bank conditions would continue to be monitored. Water quality (turbidity) monitoring would continue.

Following revegetation and bank stabilization, all removal-related materials and equipment would be removed from the site. El Portal Road would be realigned to its former location, and the paved parking area would be returned to its pre-removal state.

Design or Modifications to Minimize Harm To Wetlands

Best Management Practices and Resource-Specific Mitigation Measures

Best management practices and resource-specific mitigation measures would be implemented, as appropriate, prior to, during, and/or after removal.

Best Management Practices During Dam Removal

The National Park Service (and its contractors) shall implement the following best management practices, as appropriate, prior to, during, and/or after dam removal. Specific tasks would include, but are not limited to, the following:

- Inspect the project to ensure that impacts stay within the parameters of the project and do not escalate beyond the scope of the environmental assessment, as well as to ensure that the project conforms with the U.S. Army Corps of Engineers Special Site Permit, Cascades Dam Removal (as amended), Merced River Cascades Restoration Report, the Central Valley Regional Water Quality Control Board Waiver of Waste Discharge Requirements and Water Quality Certification, Cascades Dam Removal, and other applicable permits or project conditions.
- Implement compliance monitoring to ensure the project remains within the parameters of National Environmental Policy Act and National Historic Preservation Act compliance documents, U.S. Army Corps of Engineers Section 404 permits, etc. Compliance monitoring would ensure adherence to mitigation measures and would include reporting protocols.
- Implement natural resource protection measures. Standard measures include demolition scheduling, biological monitoring, erosion and sediment control, use of fencing or other means to protect sensitive resources adjacent to the work area, and revegetation. The measures include specific monitoring by resource specialists as well as treatment and reporting procedures.
- Confine work areas within the river channel, such as workpads to support demolition equipment, to the smallest area necessary.
- Limit the amount of rock and sediment required for the river-right bank bioengineered bank stabilization to the minimum required to stabilize and protect the slope from erosion. Amount shall be determined in consultation with National Park Service resources management staff during final project design.
- Steam-clean heavy equipment prior to its entry into the park to prevent importation of non-native plant species, and repair all petroleum leaks prior to work near the Merced River. Tighten hydraulic hoses and ensure they are in good condition.
- To minimize the possibility of hazardous materials seeping into soil or water, check equipment frequently to identify and repair any leaks, as directed in the spill prevention and countermeasure plan. Standard measures include hazardous materials storage and handling procedures; spill containment, cleanup, and reporting procedures; and limitation of refueling and other hazardous activities to upland/nonsensitive sites. Provide an adequate hydrocarbon spill containment system (e.g., floatable absorption boom, absorption materials, etc.) on site, in case of unexpected spills in the project area. Ensure equipment allowed within the river channel is equipped with a hazardous spill containment kit. Ensure that personnel trained in the use of hazardous spill containment kits are on site at all times during dam removal activities.
- Store all construction equipment within the delineated work limits.
- Ensure an emergency notification program is in place. Standard measures include notification of utilities and emergency response units prior to demolition activities. Identify locations of existing utilities prior to removal activity to prevent damage to utilities, particularly the wastewater lines that pass under El Portal Road within the project area. The Underground Services Alert and National Park Service maintenance staff shall be informed 72 hours prior to any ground disturbance. Demolition shall not proceed until the process of locating existing utilities is completed (wastewater, electric, and telephone lines). An emergency response plan shall be required of the contractor for measures that will be taken during all high-water events during dam removal, such as evacuation of personnel, equipment, and materials from the river, etc.
- Avoid damage to natural surroundings in and around the work limits. Provide temporary barriers to protect existing trees, plants, and root zones, if necessary, as determined by vegetation management staff. Trees and other vegetation shall not be removed, injured, or

destroyed without prior written approval. Ropes, cables, or fencing shall not be fastened to trees. All existing resource protection fencing (post and rope) shall be left in place and protected from heavy equipment.

- Remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Repair any asphalt surfaces that are damaged due to work on the project to original condition. Remove all debris from the project site, including all visible concrete, timber, and metal pieces. Grade disturbed areas and rake them smooth to eliminate tire tracks and tripping hazards.
- Locate, contain, and stabilize excavated and stored materials within the upland staging areas and prevent re-entry into the river.
- Use silt fences, sedimentation basins, etc. in work areas to reduce erosion, surface scouring, and discharge to water bodies, as defined in the erosion control plan prepared for this project.
- Delineate wetlands and apply protection measures during construction. Wetlands shall be delineated by qualified National Park Service staff or certified wetland specialists and clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.

Resource-Specific Measures

Hydrology, Floodplains, and Water Quality

- Prepare an erosion control plan specifying measures to prevent erosion/sedimentation problems during project construction. Include a map of the project site delineating where erosion control measures will be applied. Include the following minimum criteria, as listed in the *Guidelines for Protection of Water Quality During Construction and Operation of Small Hydro Projects* (CVRWQCB 1983):
 - Construction equipment shall not be operated in flowing water, except as may be necessary to construct crossings or barriers.
 - Where working areas are adjacent to or encroach on live streams, barriers shall be constructed that are adequate to prevent the discharge of turbid water in excess of specified limits.
 - Material from construction work shall not be deposited where it could be eroded and carried to the stream by surface runoff or high stream flows.
 - All permanent roads shall be surfaced with materials sufficient to maintain a stable road surface.
 - All disturbed soil and fill slopes shall be stabilized in an appropriate manner.
 - Surface drainage facilities shall be designed to transport runoff in a nonerosive manner.
 - Riparian vegetation shall be removed only when absolutely necessary.
 - There shall be no discharge of petroleum products, cement washings, or other construction materials.
 - Erosion control measures shall be in place prior to dam removal and in good repair by October 15 of each year.
 - Stream diversion structures shall be designed to preclude accumulation of sediment. If this is not feasible, an operation plan shall be developed to prevent adverse downstream effects from sediment discharges.

- Erosion control measures shall be inspected daily during dam removal and monthly following removal, and repaired as required.
- Waters shall be free of changes in turbidity that cause a nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits, as described in *The Water Quality Control Plan* for the Central Valley Regional Water Quality Control Board (CVRWQCB 1998). In determining compliance with the limits below, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected:
 - Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
 - Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.
 - Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
 - Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.
- Implement stormwater management measures to reduce nonpoint-source pollution discharge. This could include measures such as oil/sediment containment or street sweeping.
- Remove hazardous waste materials generated during implementation of the project from the project site immediately.
- Dispose of volatile wastes and oils in approved containers for removal from the project site to avoid contamination of soils, drainages, and watercourses. Keep absorbent pads, booms, and other materials onsite during projects that use heavy equipment to contain oil, hydraulic fluid, solvents, and hazardous materials spills.

Vegetation

- Implement a noxious weed abatement program. Standard measures include, as appropriate, the following elements: ensure that vehicles and equipment arrive onsite free of mud or seed-bearing material, certify all seeds and straw material as weed-free, identify areas of noxious weeds before dam removal, treat noxious weeds or noxious weed topsoil prior to work (e.g., topsoil segregation and removal), and revegetate with appropriate native species.
- Cover exposed soil with a combination of locally acquired native duff and forest litter from adjacent riparian sites to provide immediate groundcover and facilitate natural revegetation.
- Implement the planting prescriptions prepared for this project.
- Develop and implement a monitoring plan to ensure successful revegetation, maintain plantings, and replace unsuccessful plantings.
- Use native or seed-free mulch to minimize surface erosion and introduction of non-native plants.
- Confine all construction operations to specified project work limits. Install temporary barriers to protect natural surroundings (including trees, plants, and root zones) from damage. Avoid fastening ropes, cables, or fences to trees.
- As much as possible, removed plants and materials (cuttings) shall be salvaged and stored on site for revegetation following dam removal.

Refer to the Cascades Diversion Dam Removal Project Environmental Assessment (Chapter II, Alternatives) for a complete list of best management practices and resource-specific mitigation measures applicable to the proposed action.

The proposed action has been designed to mitigate harmful effects to wetlands. After the dam is removed, the channel of the Merced River would naturally deepen and narrow and the floodplain of the Merced River in the immediate vicinity of the impoundment would be enlarged. Newly restored floodplain would be revegetated and stabilized consistent with the project's U.S. Army Corps of Engineers Special Site Permit. Refer to Chapter II, Alternatives, for additional detail. The Cascades Diversion Dam Removal Project does not include any elements that would require preparation of a subsequent statement of findings.

Proposed Compensation

No off-site compensation is required. The proposed action is designed to restore natural fluvial processes and wetland characteristics of the Merced River and would result in no net loss of wetland extent, function, and value. Free flow and natural sediment transport would be restored.

Justification

Nonwetland Alternatives to the Proposed Action

Cascades Diversion Dam is located within the bed and banks of the Merced River, within both the 2.33- and the 100-year floodplains, and within riverine and palustrine forest habitat of the Merced River. The purpose of the Cascades Diversion Dam Removal Project is to comply with the spirit of the Wild and Scenic Rivers Act and the intent of the Merced River Plan – to protect and enhance Outstandingly Remarkable Values and restore free-flow conditions to the Merced River. There are no alternatives to the proposed action that could be located outside the floodplain or wetland and aquatic habitat of the Merced River.

New Development

No new development is proposed by the Cascades Diversion Dam Removal Project. No new facilities would be located within wetland or deepwater habitats.

Existing Development

The proposed action includes complete removal of all man-made structures that currently exist within the bed and banks of the Merced River – below ordinary high water and within the 2.33- and 100-year floodplain. It includes removal of the dam, dam abutments, intake structure, and the screenhouse (0.15 acre) and removal of rock and sediments associated with the dam (0.43 acre). Approximately 4,400 to 5,400 cubic yards of this naturally occurring rock and sediment would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion (0.32 acre).

Redevelopment

The Cascades Diversion Dam Removal Project proposes no redevelopment.

Conclusion

The proposed action would substantially reduce potentially hazardous conditions associated with flooding by removing facilities from the bed and banks of the Merced River and its floodplain. The dam, the dam abutments, the intake structure, and the screenhouse would be removed, and the related river channel located beneath the dam site would be restored.

The proposed action would have a beneficial impact on the connectivity, function, and value of wetlands by enhancing free-flowing conditions of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented.

Individual permits with other federal and cooperating state and local agencies will be obtained or updated as appropriate prior to removal activities. Mitigation and compliance with regulations and policies to prevent impacts to water quality, wetland function and values, and loss of property or human life would be strictly adhered to during and after removal.

The National Park Service has determined that there is no practicable alternative that could be located outside the floodplain or wetland habitat. No long-term adverse impacts to wetlands would occur from the proposed action. The increase in fish and wildlife functional values resulting from the restoration will provide long-term positive impact. The dam, associated structures, and sediment and rock associated with the dam will be removed from a 0.58-acre area. Rock and sediment (minus any wood or concrete debris) from the dam structure and associated sediments will be spread over a 0.32-acre area adjacent the river-right bank as stabilization. The restoration to stabilization fill ratio will be 1.8 to 1, in addition the stabilization fill and adjacent river bank areas will be revegetated with appropriate riparian plants. The project will result in a net gain of restored wetland area and functional value. This project is consistent with the NPS no net loss of wetlands policy. The National Park Service, therefore, finds that this project is in compliance with Executive Order 11990: "Protection of Wetlands."



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www.nps.gov/yose/planning/

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public land and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

